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Alcoholism and Tuberculosis.—The relation of alcoholism to tuberculosis is studied from the social point of view. The opinions expressed are illustrated by the life histories of 6 patients in whom alcoholism and tuberculosis coexisted. The conclusions are reached that the tuberculous alcoholic is essentially an asocial and untrainable person who is particularly dangerous for his surroundings. It is impossible to discipline him sufficiently to make him a fit subject for institutional or ambulatory care. His problem is primarily that of alcoholism and secondarily that of tuberculosis. He should therefore be committed and should be treated in a closed institution in a special department for tuberculous patients. To submit him to the usual care of tuberculous patients is a complete waste of money and effort.—*Sechs Lebensläufe als sozialhygienischer Beitrag zur Frage Alkoholismus und Tuberkulose, Ruth Selke, Klin. Wchnschr., May 7, 1932, xi, 805.*—(*M. P.*)

Tuberculosis and Marriage.—Medical advice should be given before the marriage of any couple, one or both of whom have been tuberculous. They should be apprised of the risks and dangers and also of the noninheritance and curability of the disease. The importance of adequate rest must be stressed.—*Pulmonary Tuberculosis and Marriage, S. V. Pearson, J. State Med., January, 1932, xl, 46.*—(*J. P. B.*)

Nontuberculous Patients Admitted to Sanatoria.—During the past 5 years 2,429 patients were admitted to the Glen Lake Sanatorium in Minnesota. Of these 2,096 were sent in as having pulmonary tuberculosis. Of this group 74 did not have tuberculosis on thorough examination, 23 being apparently normal, 29 having miscellaneous extrapulmonary conditions and 22 having nontuberculous pulmonary disease. In the second group the following diseases were represented: heart disease (8), intestinal disorders (5), syphilis (4), upper respiratory infections (4), carcinoma (2), arthritis (2), Hodgkin's disease (1), hyperthyroidism (1), actinomycosis (1), pregnancy (1). Nontuberculous pulmonary infections were found as follows: bronchiectasis (11), bronchitis (5), pulmonary abscess (2), asthma (1), empyema (1), blastomycosis (1), pulmonary fibrosis (1). In the group of nontuberculous diseases the most prevalent symptoms in the order of their frequency were: tiredness or weakness, cough, slight elevation of temperature, chest pain, haemoptysis, abnormal X-

ray shadows in the lung, loss of weight, night-sweats, frequent colds and bronchitis.—*Review of Non Tuberculous Cases Originally Diagnosed Pulmonary Tuberculosis, R. M. Burke, Minnesota Medicine, January, 1932, xv, 18.*—(*M. P.*)

Tuberculosis Problem.—The salient facts in the consideration of the problem of tuberculosis from an administrative point of view are discussed. The population of England is almost universally infected in the early years of life, but the incidence of illness and death due to this infection fell steadily in the past century. Observable trouble, resulting from childhood infection, is somewhat of the nature of an accidental occurrence in about one per cent of the infected population. The infection is derived mainly from milk, and the characteristics assumed by the organism, while often of the bovine type in the young, are increasingly those of the human type. The infectivity of persons with marked pulmonary tuberculosis can be judged most reliably from the fact that, in spite of the intimacy of married life, affected persons, as far as evidence goes, do not infect their partners. Tuberculosis schemes do not appear to have had appreciable results in reducing the amount of tuberculous illness, but have probably had a direct value in emphasizing the principles of healthy living, and thereby reinforcing the general tendency of social betterment of the past century. The general conclusion is that the aim should be to reduce infection to the minimal protective dose (for example, by the commercial pasteurization of milk) and to persevere in all efforts to improve the conditions of life in all directions.—*Factors in the Problem of Tuberculosis, J. M. Martin, Brit. M. J., January 9, 1932, no. 3705, 72.*—(*M. E. P.*)

Survey of Tuberculosis.—In Dr. MacNalty's Report of Tuberculosis, attention is forcibly arrested by the mortality and incidence curves. There has been a check in the fall in the mortality rate for young adult females although there is a steadily falling general mortality rate. In planning an effective administrative campaign, knowledge of the relative importance of infection and environment is a necessity. This report shows the general lack of such knowledge. The report gives a comprehensive survey of the tuberculosis field. There is no doubt that present clinical and administrative methods are in need of revision, modernization and standardization. Although much has been achieved, tuberculosis still accounts for 31 per cent of all deaths occurring between 15 and 45 years of age.—*A Survey of Tuberculosis, Dr. MacNalty's Report, Brit. M. J., April 9, 1932, No. 3718, 675.*—(*M. E. P.*)

Governmental Management of Chronic Pulmonary Tuberculosis.—In considering the duty of the State toward the sufferers from chronic pulmonary tuberculosis, it is stated that in London the State is active in the provision of dispensaries, residential treatment, financial assistance, care of children, better housing, and in suitable cases, colonization. Approximately 600,000 pounds are spent annually in London, by the State, in the treatment of all forms of the disease.—*The Duty of the State towards the Sufferer from Chronic Pulmonary Tuberculosis, F. J. Bentley, Tubercle, March, 1932, xiii, 261.*—(*M. E. P.*)

Governmental Management of Chronic Pulmonary Tuberculosis.—Extravagance and undue sentiment are common in the State's dealing with patients suffering from slowly progressive advanced pulmonary tuberculosis, because these individuals may be "subeconomic units" for a long time. Sanatoria should not be used for the care of these patients, but should care for those patients who are likely to recover with proper treatment. Special convalescent homes should be maintained for chronic ambulant patients, and these should be so organized as to be as nearly self-supporting as possible.—*The Duty of the State towards the Sufferer from Chronic Pulmonary Tuberculosis, J. Walker, Tubercle, March, 1932, xiii, 259.*—(*M. E. P.*)

Antituberculosis Work in Czechoslovakia.—The incidence of tuberculosis in Czechoslovakia is lessening, but is still very high, the mortality rate being 362 per 100,000 in 1918 and 180 per 100,000 in 1928-1929. The Masaryk Antituberculosis League, formed in 1919, provides dispensaries similar to those in England. There are 24 well-equipped preventoria, 29 sanatoria with 6,229 beds, and 49 pavilions near or in connection with general hospitals. A system of health insurance covers nearly two-thirds of the inhabitants of the country.—*Antituberculosis Work in Czechoslovakia, E. Morton, Tubercle, March, 1932, xiii, 255.*—(*M. E. P.*)

Tuberculin Skin Reactions among African Natives.—The "preclinical" stage of tuberculous infection, as indicated by a positive cutaneous reaction, among the Portuguese East Coast natives in the gold mines and collieries, is discussed. In 1928, tuberculin tests were made upon 1905 colliery native laborers, the Mantoux method with

0.1 cc. of 1:5,000 Old Tuberculin being used. There was a widespread degree of infection which did not appear clinically. The clinical incidence for the twelve months prior to the tests was 1.2 per 1,000 for pulmonary tuberculosis and 0.6 per 1,000 for other forms of tuberculosis. The percentage of positive reactors among "raw recruits" was 26; among natives working from one to six months, 46.62; from six to twelve months, 58.2; from one to two years, 65.12; over ten years, 56.86; average for all lengths of service, 63 per cent. This shows a rapid increase in positive reactors in the early periods of a native's industrial life, indicating early and rapid infection; afterward there was the maintenance of a fairly steady average, followed by a decline below the average after ten years' service. It is concluded that a positive reaction is practically valueless, but a negative one is of value for purposes of diagnosis, except in advanced clinical tuberculosis. The positive reactors are more likely to furnish clinical cases. Negative reactors are less likely, but the length of time of known exposure to infection must be taken into account. Negative reactors appear to have a higher natural resistance to all infections; but this needs confirmation. A natural resistance is the important factor in preventing infection in the first instance, and also in preventing it from becoming clinically manifest when present, although it is probably assisted in the second case by specific immunity. With such a high percentage of positives it is best to treat the whole community as "infected." Detuberculizing of reactors by "further infection" has nothing to support it, nor should anything be therefore expected from the use of tuberculin. With the failure of results from attempts at increasing specific immunity, attention should be paid to natural resistance and the means of increasing it. The eradication of infection present in individuals was best brought about by removal from sources of infection. As all reactors cannot be removed from the infectious area, the only course of dealing with them is to diminish, if one cannot remove, the entire source of infection.—*Observations on Tuberculo-Cutaneous Reactions and Tuberculosis, F. J. Allen, Tubercle, March, 1932, xiii, 241.*—(*M. E. P.*)

Tuberculous Infection in Rural South.—A study of the incidence of tuberculin reactors among school-children, white and colored, has been carried out in selected rural counties of Tennessee and Mississippi. The intracutaneous method was employed; the first dose consisted of 0.1 cc. of a freshly prepared dilution of 1/10,000 standardized Old Tuberculin, followed, if no reaction occurred in 48 hours, by the injection in the opposite arm of 0.1 cc. of a 1/100 dilution of Old Tuberculin. In one of the Tennessee counties 786 white and 243 colored children were tested, all of them under 19 and most of them under 15 years of age. Of 315 white children in the age group 5 to 9, 130, or 41.3 per cent, reacted and of the entire 786 white children from 5 to 19 years, 426, or 54.2 per cent, reacted. Of 88 colored children aged 5 to 9, 45, or 51.1 per cent, reacted and of the entire 243 colored children aged 5 to 19, 154, or 63.0 per cent, reacted. It is interesting, however, that, of the total 786 white children, only 118, or 15.0 per cent, reacted to the first dose (1/10,000 O. T.) while 308, or 39.2 per cent, reacted to the 1/100 dilution; whereas, of all the colored children, 33.2 per cent reacted to the weak and 29.9 per cent to the strong dilution. However, in another county, where school children and a large number of colored adults were tested, the incidence was somewhat different. In this area 328 white children were tested. Of those in the 5 to 9 year group, 28.2 per cent reacted and of the total number 44.5 per cent reacted. Among the colored children, 55.8 per cent of 282 (total number tested) reacted. In the 5 to 9 group, 37.8 per cent (34 individuals) were reactors. Five hundred and thirty-four colored people (including the 282 children) were tested. Their ages ranged from 4 to 50 years. They lived a relatively isolated life, on plantations for the most part. They showed an increasing incidence in positive reactions up to age 34, after which the incidence was practically 100 per cent. The incidence of reactors in the whole group was 70.4 per cent. In a Mississippi County, 109 Negroes, aged 4 to 50 years and all living on a plantation where manifest tuberculosis was present, revealed an incidence of 74.3 per cent, while 95 Negroes of the same ages, living on a plantation with good hygienic surroundings and no tuberculosis, gave an incidence of 54.7 per cent of reactors,—almost the same figure as obtained for 113 white farmers and their families. In general, young colored people reacted to the smaller dose in higher numbers than young white people did. All the school-children from 5 to 19 tested in these counties of Tennessee and Mississippi showed the following when compared with data obtained in school children in Philadelphia: In the white children of the South, the total incidence of reactors was 50.9 per cent and in those of Philadelphia it was 73.9 per cent. Of the colored children of the South the incidence of reactors was 60.4 per cent, while in Philadelphia it was 73.2 per cent.—*Incidence of Tuberculous Infection in Some Communities of the South, J. D. Aronson, Am. J. Hyg., September, 1931, xiv, 374.*—(*H. S. W.*)

Tuberculosis among Nurses.—This study was undertaken because there seemed to be an unusually high incidence of tuberculosis among student nurses at the Ancker Hospital in St. Paul. This institution has 975 beds, 215 of which are devoted to patients with tuberculosis. The nurses for the tuberculosis pavilion come from the nurses' training school of the hospital and are mainly from rural communities. The records in the training-school office revealed that 42 of a total of 934 nurses, or 4.5 per cent, had broken down with tuberculous disease from 1920 to 1928, either during training or shortly afterward. Of 32 young women entering training in September, 1928, 10 gave positive and 22 negative tuberculin skin tests. Of the remaining training-school students (147 nurses) 143 gave positive reactions and only 4 were negative. Nearly all of the nurses who had been in training for six months or more were infected, in contrast to an entering group, of whom only one-third were infected. Nurses in five other general hospitals in St. Paul revealed an average of 42 per cent reacting positively to tuberculin given intracutaneously in their last year of training. As all come from a similar age-group in the same community, the assumption is that the nurses from the Ancker Hospital acquire infection because part of their training brings them in contact with cases of open pulmonary tuberculosis. In 6 of 110 nurses, or 5.5 per cent, entering Ancker Hospital in the past two years, tuberculous disease has developed; five of these gave negative reactions on entering training and three had pleurisy with effusion. Tuberculosis sanatoria and tuberculosis departments of general hospitals should employ rigid contagious technique, especially in those communities in which the incidence of tuberculous infection among young adults is low.—*Tuberculosis among Nurses, E. K. Geer, Arch. Int. Med., January, 1932, xlix, 77.—(W. I. W.)*

Tuberculosis Mortality Rate in Laboring Classes.—In the German statistics, and particularly in the statistics in Baden, the labor class showed a much higher tuberculosis mortality than independent income-earners and employees, up to the year 1924. In that year the mortality rate of laborers was 156, and that of independent income-earners and employees, 96 and 99 respectively. Since 1924 the mortality in the labor class has declined more rapidly than that in the other classes, and in 1930 the respective figures were 77, 85 and 70. Similar observations are reported from other regions in Germany. Since the economic condition of the labor class has not improved during this period, other reasons must be sought for this change in the mortality rate. Various possibilities may be considered, such as increased birth-control, industrialization, a decrease in the virulence of the bacillus, improvement of hygienic conditions which improved more rapidly in the labor class than in other classes during the last few years. It is established that a larger percentage of tuberculous patients, including those of the labor class, are now returned to a normal life, particularly through the wider application of pneumothorax treatment. Under the stringent economic conditions it is frequent that a laborer does not find employment following a cure for tuberculosis. This transforms him automatically into a receiver of the dole. In this way many patients are insured a better period of convalescence than under former conditions. Another factor which is operative in reducing the tuberculosis mortality in the labor class is the fact that more laborers with open pulmonary tuberculosis are now taken out of work than formerly, thus decreasing the source of infection in shops and factories.—*Das Phänomen des Verschwindens der Tuberkulose-Übersterblichkeit der Arbeiterklasse, Geissler, Klin. Wchnschr., April 2, 1932, xi, 602.—(M. P.)*

Pulmonary Tuberculosis after Middle Age.—A study was made of 111 patients, forty-five years of age or older, all of whom, with the exception of fifteen, were kept under prolonged observation. Three facts characterize the course of pulmonary tuberculosis in the age-group which was investigated: a poor prognosis, a long duration of the illness after the first appearance of symptoms, and a preponderance of males. With the exception of diabetes, found in 7 patients, the frequency of the usual complications was not increased. The symptoms of active pulmonary tuberculosis and of diabetes were noticeable in most cases at the same time. Alcoholism, reported in 6 cases, does not seem to play an important rôle in the course of the disease. In the syphilitic group, comprising 5 patients who had previously received proper treatment, a tendency to fibrosis was observed. The physical findings are sometimes indefinite and may cause diagnostic errors because the sputum is frequently negative, and only the radiographic pictures may reveal the presence of extensive lesions or big cavities, the latter of which are often silent clinically. The comparative rarity of conjugal tuberculosis is mentioned, while various forms of tuberculosis were found in 17 children of the entire group. The evolution of phthisis at ages above forty-five is attributed to a lowering of resistance after many years

of intense physical activity and to family worries. Concerning treatment, the necessity of sanatorium care, preferably at a low or middle altitude, is stressed. In unilateral lesions, collapse by artificial pneumothorax may be considered. Of the 13 patients treated by artificial pneumothorax, 5 improved, one remained in a stationary condition and 7 died. Phrenic evulsion seemed to give better results in middle-aged patients and was resorted to in several cases, but thoracoplasty is considered too grave an operation for the age-group above forty-five. The effectiveness of prophylactic and therapeutic measures depends on early diagnosis, which can be made if X-ray pictures are taken and sputum examinations are made in all doubtful cases.—*Quelques considérations sur la tuberculose pulmonaire au-dessus de quarante-cinq ans, W. Jullien and A. Wignoille, Rev. d. l. Tuberc., January, 1932, xiii, 12.—(K. F.)*

Immunization with *BCG*.—This is a preliminary report of the series of parenteral *BCG* vaccinations performed through the Health Department of New York City between May, 1929, and January, 1931. Of the 78 children vaccinated none died of tuberculosis, but no attempt to draw any conclusions covering the protective value of the procedure was made, as less than half of the group was vaccinated longer than a year before this report. Seventy-three of the group were from families having cases of open tuberculosis and 5 from families with closed lesions. Two-thirds of the group were less than twelve months of age when vaccinated, and all gave negative intracutaneous reactions to 2 mgm. of O. T. None of the children showed physical signs or X-ray evidence of tuberculosis, and most of them (64) were separated from tuberculous persons during the period intervening between vaccination and the appearance of a positive Mantoux reaction. The dosage of *BCG* for those who were followed for more than 3 months was from 0.001 to 0.05 mgm. subcutaneously (20 cases), and of from 0.003 to 0.15 mgm. intracutaneously (54 cases). The following clinical consequences were among those noted: Local lesions appeared in 60 per cent of those vaccinated subcutaneously, between the second and twenty-sixth week of vaccination. These were chronic cold abscesses healing in about four months. In those vaccinated intracutaneously local lesions appeared in 94 per cent, on the average between the second and third weeks after vaccination. These were similar to large skin tuberculides and healed within one to three months. Enlargement of the regional lymph nodes occurred in 60 per cent of the subcutaneous group, usually after the cold abscess had opened and secondary infection taken place, and in 86 per cent of the intracutaneous group, as a rule, slight. A positive Mantoux test (0.2 mgm.) appeared in 90 per cent of those vaccinated subcutaneously, the average time of appearance being 6½ weeks, and in 85 per cent of the intracutaneous group, the average time four weeks. In the subcutaneous group 50 per cent were still positive to 0.2 mgm. after twelve months, while 64 per cent of the intracutaneous group lost their sensitiveness in the average time of six months. Parenteral *BCG* vaccination was found to be harmless in this series.—*Parenteral BCG Vaccination, Camille Kereszturi, W. H. Park and B. Schick, Am. J. Dis. Child., February, 1932, xliii, 273.*—(*M. D.*)

Immunization with *BCG*.—The authors (Madrid) studied the effect of oral vaccination with *BCG* during the first fifteen days of life in a group of abandoned infants who were given institutional care until at least two months of age and then reared in foster homes. Many of these children returned to the institution at the age of one to two years because of various diseases, and the autopsies on those who died furnished the material for this study. A high degree of immunity (and allergy) occurs only in those (about 50 per cent) in whom mesenteric lymph-node lesions result from oral *BCG* administration, these being of a benign, healing type. In the remainder, in whom a positive tuberculin reaction is not produced, subsequent tuberculous infection may occur, but in usually benign and only exceptionally progressive. Of 18 infants who had not been vaccinated and who had tuberculous lesions at autopsy only three (16.6 per cent) had mesenteric lymph-node lesions while of 22 who had been vaccinated and showed tuberculous lesions at autopsy, 18 (72 per cent) had mesenteric lymph-node involvement. In no instance in the vaccinated group was intrathoracic lymphatic tuberculosis found concomitant with mesenteric lymphatic lesions.—*Contribution a la connaissance du mécanisme d' immunisation au moyen du vaccin de Calmette, B. Frias and E. J. Roldan, Arch. de Méd. d. Enf., December, 1931, xxxiv, 713.*—(*M. D.*)

Immunization of Cattle with *BCG*.—Three groups of cattle were used in experiments designed to test the immunizing power of *BCG*. These groups were (1) calves born in tuberculous surroundings and vaccinated subcutaneously with *BCG* at birth and yearly thereafter; (2) calves born in similar surroundings and vaccinated by mouth with *BCG* at birth; and (3) calves born in healthy,

nontuberculous surroundings, vaccinated by mouth with *BCG* at birth and placed in tuberculous surroundings several months later. Each group was pastured with a comparable number of unvaccinated calves. The animals were given from 90 to 110 mgm. of *BCG* at each inoculation or feeding. In group 1, three calves inoculated at birth and at the end of each of the next two years were killed three years after the last inoculation and two years after removal from exposure, together with three nonvaccinated calves of the same age and environment. All had tuberculosis which was rather extensive. In group 2 three calves, vaccinated by mouth with 120 mgm. of *BCG* at birth and yearly for two years, were autopsied two years after the last dose of *BCG* and one year after removal from exposure, together with three comparable control calves. The results were not strikingly different in the two lots, both of which had tuberculosis. In each of these two groups, when the animals were removed from exposure, the *BCG* lot and the control lot were separated and were kept away from each other until they were sacrificed. Nearly all the calves in the experiment were positive when tested with tuberculin. In group 3 two calves from healthy surroundings were vaccinated by mouth at birth and, when weaned, were placed in tuberculous surroundings along with two unvaccinated controls. Autopsies from one to three years later revealed a moderate amount of tuberculosis in all four animals and in approximately an equal degree in all. Tissues from each produced tuberculosis in guinea pigs when inoculated. Of 48 guinea pigs inoculated with *BCG* one died from generalized tuberculosis which, it was thought, might possibly have been an instance of spontaneous disease. Therefore, 40 guinea pigs were inoculated subcutaneously and 40 intraperitoneally each with 5 mgm. of this strain. They were carefully housed and cared for completely away from other tuberculous animals. None showed evidence of progressive tuberculosis although some of them lived two years. This culture was grown on Sauton's medium. These experiments indicate that the best which could be hoped for from inoculation of animals with *BCG* is prolongation of life. In human beings this is desirable but in cattle it is uneconomical and undesirable.—*Second Report on the Calmette-Guérin Method of Vaccinating Animals against Tuberculosis, W. E. Cotton and A. B. Crawford, J. Am. Veterin. Med. Assn., January, 1932, lxxx (n.s. xxxiii), 18.*—(*H. S. W.*)

Dissociation of *BCG*.—Theoretically it must be expected that *BCG*, similar to other avirulent variants of virulent organisms, is not a permanent modification and can revert to its virulent form under certain conditions. It is unjustified to postulate that only such observations should be acknowledged which can always be repeated at will, since variations in microörganisms occur irregularly, their necessary conditions not being well established. In particularly careful and long-drawn-out experiments, the dissociation of *BCG* was attempted. The original strain was subcultured on bile-free media. It was completely avirulent to begin with. Four different variants as to colony-formation were isolated. One, a streak-form, was obtained 3 times in 160 cultures. This colony was flat, with a ruffled surface and irregular border. From this colony another variant was isolated, which grew in the form of moist hemispheres. The streak-form was unusually virulent for guinea pigs and it could be propagated through animal passage. The virulence was retained for at least one year. The moist hemispheres were also virulent. The former colony type proved to be virulent for rabbits. It is unknown so far what conditions favor the splitting off of virulent forms from the originally avirulent *BCG*.—*Dissoziationsversuche mit BCG, Seiffert, Klin. Wchnschr., January 30, 1932, xi, 181.*—(*M. P.*)

Tuberculin from *BCG*.—In order to determine whether tuberculin from *BCG* cultures causes the same skin reaction in normals as Koch's tuberculin, simultaneous tests with both tuberculins were made on 62 patients. Of these, 29 had previously been treated with *BCG* and 7 had had tuberculin tests with Koch's preparation. In 5 patients both reactions were negative. In 30 patients, there was noted some difference in the intensity of the reaction or in its course, while in 37 both reactions were of the same intensity. The results obtained seem to indicate that there is no appreciable difference in the reactions produced by the two tuberculins, and that the previous administration of *BCG* has no influence on the degree of either the Old Tuberculin, or the *BCG* reaction.—*Étude clinique comparative des cuti-réactions produites par la tuberculine brute de Koch et par la tuberculine brute de BCG., F. Gomez and J. C. Négro, Rev. d. l. Tuberc., November, 1931, xii, 1091.*—(*K. F.*)

Trauma and Pulmonary Tuberculosis.—Any established correlation between trauma and tuberculosis of the lungs must be based on anatomical and clinical knowledge of the development and course of the ensuing pulmonary disease, and not be grounded on vague reference to fatigue and general dele-

terious effects. The significance of trauma in the development of tuberculosis of the lungs in any given person is subject, first, to the status of tuberculous infection in that individual, and, second, to the time which elapses between the trauma and the manifestation of pulmonary disease. Individuals subject to accident must fall into one of the following categories: (1) without tuberculous infection; (2) with well-healed primary infection; (3) with both well-healed primary infection and reinfection; (4) with manifest pulmonary tuberculosis resulting from an extension of the primary infection; (5) with primary infection; or (6) reinfection in the body outside the lungs. It is only under the most hypothetical conditions that trauma can have an aetiological bearing on the development of pulmonary tuberculosis in the first group, as direct exogenous infection with the tubercle bacillus does not occur. In the remaining groups an endogenous reinfection is also conceivable. This may result indirectly over a period of time through debility, in which case the trauma may presumably be held indirectly responsible. The direct reactivation of an endogenous focus as a result of trauma can only be assumed on the grounds of structural alteration of the focus, leading to a direct extension of the process locally, or rupture into the blood- or lymph-stream, with subsequent dissemination of tubercle bacilli, processes which are accompanied almost immediately by manifestations of acute clinical disease. An existing direct aetiological correlation between trauma and developing pulmonary tuberculosis is justifiable only under these last mentioned conditions.—*Trauma und Lungentuberculose, H. Koenigsfeld, Schweiz. med. Wchnschr., May 21, 1932, lxii, 494.*—(*V. T.*)

Activation of Tuberculosis Foci by X-Rays.—The taking of X-ray plates of the chest may be fraught with danger for individuals either with quiescent tuberculous foci or with tuberculous pulmonary disease. In apparently healthy persons a single X-ray exposure of the chest for three to four minutes may reactivate a quiescent tuberculous pulmonary focus and initiate thereby pulmonary disease; in patients with manifest pulmonary disease, a focal reaction may develop, as indicated by elevation of temperature, acceleration of sedimentation time, alteration in blood proteins and increase in basal metabolic rate. Similar blood changes do not occur in individuals without tuberculous infection following identical roentgenological procedure or in patients with pulmonary tuberculosis when parts other than the chest are subjected to the same X-ray exposure. These changes therefore are not the direct result of the effect of the roentgen-rays on the blood, but manifestations of a focal reaction initiated by the action of these rays. —*Kann eine einmalige Lungdurchleuchtung latente Tuberkuloseherde aktivieren?, Tsamboulas, München. med. Wchnschr., April 22, 1932, lxxix, 671.*—(*V. T.*)

Respiratory Infections and Vitamine A.—The object of this purely clinical study was to ascertain whether any relationship exists between the vitamine-A content of the diet and the occurrence of respiratory infections. The incidence and severity of these infections were determined in four groups of infants, receiving various quantities of vitamine A in their diets. The first group comprised 19 infants receiving partly skimmed milk; the second, 94 infants, receiving pasteurized milk and 20 drops of viosterol; the third, 85 infants, receiving pasteurized milk and 3 teaspoonfuls of standardized codliver oil; and the fourth, 6 infants, receiving pasteurized milk and 6 teaspoonfuls of codliver oil. All infants were given orange juice at 6 weeks, butter at 6 months, and vegetables at 8 months of age. Thus the four diets represented a small, a moderate, a large, and a maximum amount of vitamine A. These infants were observed in an institution, for periods varying from four to twelve months. Respiratory infections were classified as mild, moderate or severe (purulent otitis media, mastoiditis and pneumonia being classed as severe infections). The results may be summarized briefly: No significant difference in incidence or severity of respiratory infections was noted in the four groups of infants. Thus the group which received the largest daily amount of vitamine A, through the addition of codliver oil, was not protected against respiratory infections to a greater degree than were the other groups.—*Relationship of Vitamin A to Respiratory Infections in Infants, L. H. Barenberg and J. M. Lewis, J. Am. M. Ass., January 16, 1932, xcviii, 199.*—(*G. L. L.*)

Endogenous Pulmonary Tuberculosis.—The question of the origin of adult pulmonary tuberculosis is of the first importance, not merely from the academic point of view, but because, until the question is accurately decided, public-health measures can be of only doubtful value and progress cannot proceed logically and satisfactorily. Pulmonary tuberculosis may be defined as a late manifestation of a childhood infection, its outbreak being determined by some added factor which, by lowering the resistance of the body, allows the development of the disease which was hitherto controlled and latent. There is no resemblance between

infantile and adult tuberculosis. The form that is met with clinically is generalized, fatal and rapid, while the other is localized to one organ until later stages. One great difficulty in being dogmatic about tuberculosis is due to the fact that the primary focus of infection escapes detection. A difficulty which the upholders of reinfection need to explain is that persons who have had one disease are commonly protected from another attack of the same disease, or, if their immunity disappears, the fresh attack resembles the original malady in all appearances except perhaps in so far as virulence is concerned. The known and undoubted differences between adult and infantile tuberculosis suggest that the former is not just a case of reinfection, but that some other factor is needed to explain the varying peculiarities of the two conditions. Fishberg discusses an analogy between pulmonary tuberculosis and syphilis. In both diseases we have the infection, followed by generalization of the infection, succeeded in each case by a variable period of years of good health during which there is no evidence that anything is wrong. This period of quiescence is followed by late manifestations of disease. If the exogenous theory is the correct one, the danger of infection should be borne out by masses of evidence. Such is not the case. Without the assistance of predisposing causes, microörganisms can be proved to be present in large numbers without producing disease.—*The Endogenous Origin of Adult Pulmonary Tuberculosis, V. S. Hodson, Tubercle, February, 1932, xiii, 199.*—(*M. E. P.*)

Miliary Tuberculosis in Infant.—A female baby of 8 months presented what was thought to be an acute respiratory infection. This cleared up in about a week. On the tenth day her temperature abruptly rose to 103° without apparent reason. A roentgenogram taken on the fifteenth day was suggestive of miliary tuberculosis. The tuberculin test became positive. Subsequent films showed a progression of the disease in the lungs. The child died ten weeks after admission. Her clinical condition was good until signs of meningeal irritation became evident in the ninth week. It was thought that the blood-stream infection and generalized seeding took place when the unexplained rise in temperature occurred.—*The Development of Miliary Tuberculosis in an Infant, E. C. Vogt, Radiology, December, 1931, xvii 1300.*—(*T. O. R.*)

Pulmonary Tuberculosis in Children.—The lesions caused by clinical primary tuberculosis, as shown in the roentgenogram, may vary greatly in appearance, according to the extent, location and phase of the disease at the time the film is taken. It may show (1) a circumscribed or more diffuse infiltration, pneumonic in appearance, varying in extent from a few centimetres in diameter to the involvement of nearly the whole of one lobe of the lung, and with or without demonstrable tracheobronchial lymph nodes; (2) a small nodule in the lung, with or without visible lymph-node masses in the hilum; (3) circumscribed masses of caseous nodes projecting outward from the mediastinum; (4) masses of calcified tracheobronchial lymph nodes and no obvious lesion of the lung; and (5), rarely, an area of infiltration with rarefied centre due to excavation and usually associated with enlarged uncalcified tracheobronchial lymph nodes. Areas of infiltration of the exudative or productive types associated with calcified pulmonary nodules or tracheobronchial lymph nodes are classified as the adult type of tuberculosis. These active lesions of adult-type tuberculosis are superimposed on the childhood type which have existed for a considerable time. It is of prognostic importance to determine whether a given lesion is of the childhood or adult type. In the former, the lesion tends to retrogression. Treatment in many cases requires only general hygiene and the prevention of further infection. The prognosis is good. In the latter, the lesion tends to progress. Treatment must be rest in one of its applied forms. The prognosis is doubtful. Periods of quiescence alternating with reactivation may continue over a long time before healing is established even in favorable cases. The bronchopneumonia caused by the tubercle bacillus may be identical in appearance with that caused by the pneumococcus. The exudate in the former will often take weeks and months to resorb, while the latter usually disappears in one or two weeks. Increased densities at the root of the lung are often due to fibrosis and to blood-vessels. Calcification occurs in the caseous tissue caused by tuberculosis. Blood-vessels are often caught in the same axis as the ray, and then they may present a column of blood two or more centimetres in depth, which will produce a density as great as calcium. These spots are homogeneous in density. They are circular or oval in form with clear-cut margins and often accompanied by a bronchus in cross-section. Calcified lymph nodes, in contrast, are uneven in density, irregular in outline and usually larger in area. Another film taken at a different angle will cause this spot, if made by a blood-vessel, to disappear, but, if due to calcified tissue, it will remain in view.—*The Evolution of Pulmonary Tuberculosis in Children as Revealed by the*

Roentgenogram, H. D. Chadwick, Am. J. Roentgenol. & Rad. Ther., January, 1932, xxvii, 46.—(W. I. W.)

Childhood Tuberculosis.—This report represents a statistical study of 5,816 children examined at the Lymanhurst School for Tuberculous Children in Minneapolis from the standpoint chiefly of skin reactions to tuberculin (Pirquet), roentgen films of the chest, and physical examinations. Of the children, 31.6 per cent (1,835) had positive Pirquet tests and 68.4 per cent (3,981) were negative. With questionable and slight intrathoracic lymph-node calcifications excluded, the more conspicuous and readily identified lesions typical of tuberculosis of first infection (X-ray) were found in 25.9 per cent (475) of the group having positive Pirquet test and 0.58 per cent (23) of the children who were negative. These lesions were classified as follows: (1) Resolving parenchymal pneumonic-like consolidations (epituberculosis ?), present in 3.6 per cent (66) of the group with positive tests, most frequently found in the second year of life. None of the children with negative tests showed such lesions. (2) Unequivocal intrathoracic lymph-node calcification alone (moderate or marked degree), present in 7.09 per cent (130) of the positive group and 0.125 per cent (5) of the negative. Questionable or slight calcification of the hilar lymph nodes was reported in 18.6 per cent (351) of the positive and 3.3 per cent (31) of the negative group. (3) Ghon tubercles (associated with varying degrees of lymph-node calcification), present in 15.2 per cent (276) of the positive group and 0.45 per cent (18) of the negative. Evidence of the adult type of tuberculosis was found in 2.5 per cent (45) of the children with a positive Pirquet reaction and 0.075 per cent (3) of those with negative tests. With a value of 100 per cent assigned to the Pirquet test as measuring its efficiency in the discovery of childhood tuberculosis, the roentgen examination has a reliable efficiency of 25 per cent and the physical examination a small fraction of 1 per cent.—*Pulmonary Diseases: 5,816 Cases in Children, with Special Reference to the Childhood Type of Pulmonary Tuberculosis, C. A. Stewart, Am. J. Dis. Child., April, 1932, xliii, 803.—(M. D.)*

X-Rays in Pulmonary Tuberculosis in Children.—History, symptoms, and physical signs furnish insufficient data to establish a diagnosis of tuberculosis in children. A positive tuberculin reaction merely proves that tuberculous infection is present although the degree of reaction may give some indication of the severity of the lesion. However, roentgenographic examination established a positive diagnosis of intrathoracic tuberculosis in 28 per cent more cases than did purely clinical methods. The percentage of positive X-ray findings was much higher in those cases with the largest tuberculin reactions. In addition, roentgenograms frequently furnish the only means of studying the evolution of these lesions. Therefore, roentgenograms should be made routinely on all children with a positive tuberculin reaction.—*Roentgenologic Evidence of Chest Tuberculosis in Tuberculin-Positive Ambulatory Children, R. S. Stone and E. Wolff, Radiology, November, 1931, xvii, 940.—(T. O. R.)*

Chest X-Rays and Intracutaneous Tests in Children.—In an attempt to estimate the value of radiological examination of the chest in the diagnosis of tuberculosis in childhood, 500 children were tested with tuberculin intracutaneously, and at the same time examined radiologically. It was concluded that abnormal radiograms of the chest in children become more frequent as the age of the child increases. Children who react positively to tuberculin show a higher percentage of intrathoracic lesions as seen radiologically than do those who give a negative reaction. Since 35 per cent of the nonreactors to tuberculin had positive radiograms, the lesions found in these cases are presumably nontuberculous. It follows that, of the 51 per cent of the reactors who show a positive radiogram, a considerable number must be discounted in estimating the radiological incidence of intrathoracic tuberculous lesions. In other words, in children infected by the tubercle bacillus, intrathoracic tuberculous lesions, radiologically demonstrable, are very few. A very large number of infiltrations seen in children are nontuberculous. The distribution of the infiltration appears to be much the same in all children, whether they are infected with the tubercle bacillus or free from infection. It is suggested that upper-zone are more likely to be tuberculous than lower-zone infiltrations. In view of the fact that 22 of the 51 children who were considered to have radiological evidence of calcified tracheobronchial lymph nodes did not react to tuberculin, it would appear that radiological criteria were not sufficiently strict. In every case in which there is any doubt about the presence of calcified lymph nodes, an oblique radiogram should be taken, so as to exclude the possibility of mistaking a blood-vessel or other structure viewed "end on" as being a calcified nodule. Fibrosis appears to be as common in nonreactors as reactors. Intrathoracic tuberculosis is comparatively uncommon

in children under 15 years of age. It would appear that, in attempting to localize the lesion in children who are shown to be tuberculous by a positive intracutaneous reaction, the chest radiogram is not so helpful as might have been supposed. The lesions, if in the lymph nodes, are invisible unless calcified, and the majority of such lesions may be extrathoracic. Nontuberculous infiltration and fibrosis are more common than tuberculosis, from which they cannot be differentiated with certainty. Therefore, while the chest radiogram in children is of great clinical value, it has these definite limitations, and its interpretation in the "Mantoux-positive" child needs the greatest care.—*A Comparative Study of Chest Radiograms the Mantoux Test in Children, D. J. Dow and W. E. Lloyd, Brit. M. J., April 16, 1932, no. 3719, 701.*—(*M. E. P.*)

Root of Lung in Childhood.—The term "pathological" may mean "diseased" or "not normal." A really normal root is not found in adults, although this does not mean it is pathological in a strict sense. In children, increase of size and density in the hilar shadow are found that cannot be regarded as pathological when clinical symptoms are absent. This lack of precision in the use of the word "pathological" has led to much confusion. The width of the hilar shadow in children furnished little evidence for the diagnosis of lymph-node enlargement. Its density is more important, an increase in density always being suggestive of lymphatic involvement. In general, it may be said that the denser the shadow, the older the process is. Calcifications are rare in the hilum of children. In determining degrees of intensity of the root shadow, a comparison of the two hila is a valuable criterion. However, it is necessary to expose both hila in their entirety. This is accomplished by turning the patient a trifle on his body axis to the right for one exposure, and to the left for a second exposure. In the acute stage, the primary pulmonary focus frequently is not visible but the lymph-node enlargement is marked. Roentgenological examination in this stage is especially valuable. The primary foci become visible later as calcified or uncalcified, isolated areas of density. They are found most frequently in the lower field, some distance from the hilum, and more often on the right side. Frequently, strands can be seen extending from these foci to the hilum. These are probably infiltrated lymphatics and connective tissue. The most frequent cause of lymph-node swelling is tuberculosis. Where a distinct primary complex can be roentgenologically demonstrated, this diagnosis is certain. In the remaining cases other infectious processes must be considered and the diagnosis cannot be established roentgenologically. The clinical findings are always indispensable in establishing the diagnosis. Because a portion of the lymph nodes can never be demonstrated roentgenologically, since they fall within the middle shadow, a lymph-node involvement cannot be excluded in the absence of positive roentgenological findings. The roentgenological examination, however, constitutes the most important part of the whole examination. A roentgenological diagnosis of tuberculous bronchial lymph nodes is not made as often as it should be.—*The Hilus of the Lung in the Child, D. W. Althschul, Radiology, December, 1931, xvii, 1147.*—(*T. O. R.*)

Nontuberculous Pulmonary Infections in Children.—Chronic nontuberculous pulmonary infections in children present a very definite clinical syndrome. These infections have had various labels, such as chronic bronchitis, recurrent bronchitis, unresolved pneumonia, recurrent or interstitial pneumonia, and fibrosis of the lung with or without bronchiectasis. The common predisposing factors are whooping-cough and measles with accompanying bronchitis; attacks of acute bronchitis with upper-air-passage obstructions; bronchopneumonia with subsequent damage of the bronchial epithelium. Recurrent attacks of paroxysmal cough, purulent and offensive sputum, haemoptysis, dyspnoea, pain in the chest with irregular fever, are the usual symptoms. Early clubbing of the fingers, pleural thickening and fibrosis, with resulting physical signs, are common. X-ray studies show increased hilum shadows and striations extending toward the base; some diminution of movement of the diaphragm with peaking; displacement of the heart toward the affected side; cavities with fluid-levels; and bronchial dilatation in the more advanced stages. It is necessary to exclude pulmonary tuberculosis in the differential diagnosis. The recent work in America has created the impression that pulmonary tuberculosis is relatively common in children. X-ray studies and the use of the Mantoux tuberculin test at the Bromptom Hospital have not confirmed this view. Out of 500 children, only three were definitely proved to have active tuberculosis, and in those the lesions were in the upper part of the lungs. The age during which chronic nontuberculous disease of the lung is common appears to be the age at which chronic pulmonary tuberculosis is uncommon. Death may occur during an acute exacerbation in childhood, but after adolescence the prognosis is fair as regards death. Secondary infection with tubercle

bacilli is uncommon. Prophylaxis, regulation of rest and exercise, and hygienic measures are necessary. Postural drainage and evulsion of the phrenic nerve are sometimes helpful.—*Chronic Non-Tuberculous Infection of the Lungs in Children, F. H. Young, Brit. M. J., April 2, 1932, no. 3717, 604.*—(*M. E. P.*)

Tuberculosis of Bovine Origin.—A report of a special committee, appointed by the People's League of Health to make a survey of tuberculosis of bovine origin in Great Britain, is reviewed. It is estimated on the basis of the tuberculin reaction that at least 40 per cent of the cows are infected with the tubercle bacillus, though only a minority of them are in an infective condition; that about 0.2 per cent of all cows are suffering from tuberculosis of the udder, and are therefore probably excreting living tubercle bacilli in the milk; that about 40 per cent of cows slaughtered in the public abattoirs show gross lesions of tuberculosis; and that a proportion of the raw market milk, varying in different parts of the country from 2 to 13 per cent, with an average figure of 6.7 per cent, contains living tubercle bacilli. So far as man is concerned, it is estimated that about 6 per cent of all deaths from tuberculosis are caused by the bovine type of bacillus; that about 2,000 deaths, mostly in children, occur annually from this cause; that at least 4,000 fresh cases of bovine infection develop each year; and that an immense amount of suffering, invalidism, and often permanent deformity is caused by this bacillus. It is recommended that an endeavor be made to build up herds entirely free from tuberculosis, by methods now practised in Canada and the United States, and that all milk should either be from certified herds or be subject to pasteurization.—*Tuberculosis of Bovine Origin in Great Britain, General Article, Brit. M. J., April 2, 1932, no. 3717, 618.*—(*M. E. P.*)

Eradication of Bovine and Avian Tuberculosis.—In the United States progress in the eradication of bovine tuberculosis continues apace. In July, 1931, about 30,000,000 cattle were under supervision for the control of bovine tuberculosis in areas which comprise more than 11,222 counties that are now designated as accredited areas. Indiana has been admitted to the small list of states that are accredited throughout their entire area. Indemnity is now being paid in California. Veterinarians are doing an increasing volume of work on eradication. Funds are available for more work on the control and eradication of avian tuberculosis. Last (fiscal) year 1,162,414 herds (13,782,273 cattle) were tested with tuberculin, which revealed a reaction in 203,778 cattle, or 1.5 per cent. In Canada progress is likewise being made. There, 1,500,000 cattle are under federal supervision and 150,000 herds are accredited. Nearly one and one-half millions of dollars was expended last year as indemnity for 60,000 reactors. The status of *BCG* vaccination still remains one of controversy and uncertainty, and little absolute data exist to justify more than an experimental application of *BCG* vaccination. It has been proved that the strain may be materially changed and its virulence enhanced, and therefore it is not a *virus fixé* as claimed by Calmette. It appears that the stability of the virus depends upon its environment and that, once in the animal body, the environmental factors are not under control. As regards immunity from *BCG* vaccination, claims are not corroborated by experimental data which would justify its employment as a general procedure. "The results in a good many completed trials have not been published, possibly because they fell far short of hopes and expectations, and the silence that is maintained would seem to be ominous." Funds are available for an increased amount of work on avian tuberculosis in fowl and swine. Large poultry packers and poultrymen are realizing the significant economic aspect of this problem. From 8 to 24 per cent of adult chickens slaughtered in some districts are infected with tuberculosis. The public is learning such facts as these and this has its repercussion on the industry. The last annual Midwestern States Tuberculosis Conference confined its discussion to the questions related to this disease and evolved a practical scheme that should find wide acceptance. It urged (1) spread of information to farmers about the extent and symptoms of the disease, methods of detection and elimination of diseased fowl from flocks; (2) rejection by dealers of all diseased birds; (3) test and examination of fowls by veterinarians who are testing cattle on the farm; (4) selection of given areas for intensive eradication campaign.—*Report of the Special Committee on Tuberculosis, C. E. Cotton, A. E. Wight, T. H. Ferguson, E. A. Watson and A. F. Schalk, J. Am. Veterin. Med. Assn., October, 1931, lxxix (n. s. xxxii), 526.*—(*H. S. W.*)

Incipient Pulmonary Tuberculosis.—Attention is called to two forms of pulmonary tuberculosis in the adult, one originating from a tuberculous adenopathy which extends from the hilum toward the periphery into the pulmonary parenchyma, while the other is first observed within apparently normal lung tissue, has no connections with the

hilum, and extends from the periphery toward the mediastinum involving, by contiguity, the adjacent lobules. The descriptive French terminology terms the first group of lesions *tuberculoses médiastino-hilo-pulmonaires*, indicating their anatomical character and their mode of propagation. There are exceptions to the rule that pulmonary lesions in the adult are never associated with a lymphatic reaction, in contradistinction to the tracheobronchial adenopathy, which is always present in pulmonary tuberculosis in the child. Cases of hypertrophic tracheobronchial adenopathy are occasionally seen in adults, and 3 cases are reported and illustrated with radiographs, in which the lesion started from a solitary node, or a group of nodes in the hilar region, and extended through the lymphatics of the interstitial tissue to the pulmonary parenchyma, (*tuberculose ganglio-trabéculo-bronchio-alvéolaire*); at that time sputum becomes positive. The prognosis is good; and a sudden appearance and rapid and complete retrogression of these comparatively rare forms are characteristic. The second group comprises strictly parenchymatous lesions. Their site of predilection is the subclavicular region. The insidious onset and the scarcity of physical findings are emphasized, and the various developments are described; they are considered as haematogenous in origin.—*Des stades précoces et du méchanism de certaines tuberculoses de l'adult, Chabaud, Rev. d. l. Tuberc., October, 1931, xii, 946.*—(*K. F.*)

Early Pathological Stages of Pulmonary Tuberculosis.—Pulmonary tuberculosis in adults originates from the apparently encapsulated, calcified or ossified primary complex or from diseased lymph nodes tributary to these. It is common to observe a new area of disease which lies in close proximity to the lesion, that comprises the primary complex and which had developed endogenously (and thus usually haematogenously) from the preëxisting focus. During puberty the old fibrous or calcified lesions are more likely to soften and lead to reactivation with perifocal and haematogenous reinfection. Calcified foci, which have arisen from the primary complex by the haematogenous route, are often multiple and (rarely) miliary. Pulmonary tuberculosis originating from the reactivation of a calcified focus is predominantly an isolated disease. The so called early infiltration appears to originate from reactivated apical tuberculosis and to develop through bronchogenic spread. However, in quite a proportion of instances of early infiltration, no apical or other focus except, of course, the primary complex, is demonstrable. Also, in instances of advanced pulmonary tuberculosis with the older lesions below the apex, it is not uncommon to observe fresh lesions developing in the apex. Both these types represent true cases of the so called infraclavicular infiltration or their precursor, which is known as Fraenkel's circle foci.—*Pathologisch-anatomisches zum Beginn der chronischen Lungenphthise, W. Pagel, Deutsche med. Wchnschr., December 11, 1931, lvii, 2094.*—(*H. S. W.*)

Early X-Ray Stages of Pulmonary Tuberculosis.—Numerous types or stages of lesion are discernible in the X-ray film, since they cast characteristic shadows. Some of these are the primary *Affekt*, the haematogenous focus, the apical focus, the early infiltration, etc. Careful observation of films has led to the placing of considerable importance upon the so called "circle-foci" or "nodules" (Rundherde) which are thought to represent the earliest roentgenological evidence of adult tuberculosis. They appear to be the precursors of the early infiltration. These foci appear in the film as spherical or circular, homogeneous shadows, the size of a dime or quarter-dollar, and lie in otherwise quite normal pulmonary tissue. They may persist unchanged for a considerable time or may be transformed into isolated cavities, when they come to represent the early (cavernous) infiltration. They are found incidentally in examinations of contacts who are without symptoms. These patients do not have tubercle bacilli in their sputum. Such shadows may be caused by nontuberculous disease, such as bronchopneumonia. In this event they disappear within two weeks of their formation. The progress of these foci is of great diagnostic importance and repeated X-ray observation is necessary. At this stage active treatment is unnecessary.—*Krankheitsanfaenge bei Lungentuberkulose Erwachsener, A. Fraenkel, Deutsche med. Wchnschr., December 11, 1931, lvii, 2091.*—(*H. S. W.*)

Development of Pulmonary Tuberculosis.—The fact that the origin and development of pulmonary tuberculosis appear under so many different manifestations is due to the multiplicity of causative and modifying factors. It is suggested that the totality of these factors be termed "constellation." Some of the important factors are discussed, such as blood- and lymph-content, rapidity of blood- and lymph-stream, oxygen and carbon-dioxide content, other nutritive substances, split products of tissue and bacilli which may be toxic. Since all these factors are not necessarily altered in a parallel way, an uncontrollable number of different constellations may occur. This point of view

explains why many different opinions are voiced in regard to the significance of certain single factors. A single factor may play a totally different rôle if the rest of the constellation is different. The individuality of the constellation makes every patient an individual case.—*Die Bedeutung der Konstellation für die Entstehung und den Verlauf der Lungentuberkulose, N. P. Tendeloo, Klin. Wchnschr., April 16, 1932, xi, 665.*—(*M. P.*)

Pleuropulmonary Tuberculosis.—There are forms of tuberculosis which are characterized by the simultaneous, or almost simultaneous, development of a pulmonary lesion and a pleural effusion, which should be recognized as a distinct entity. In accordance with Grancher's views, that the pleurisy and pulmonary lesion represent two localizations of the same pathological process, there is no essential difference between the primary and the secondary pleurisy. In the first, the pulmonary lesion remains clinically silent; in the latter, symptoms referable to the pulmonary involvement predominate in the clinical picture. On account of the chronological development in the pulmonary parenchyma and pleura, and on account of the varying degree with which the two structures participate in the inflammatory process, certain forms of the pleuropulmonary disease can be isolated which are well defined by characteristic symptoms. When the inflammation extends to the pleura from a preexisting pulmonary lesion, the onset is, as a rule, insidious. Loss of weight, lassitude, loss of appetite, a dry cough and subfebrile temperatures, the classical symptoms of incipient pulmonary tuberculosis, prompt the patient to seek medical advice. The chest examination reveals not only the focus in the lung, but also the presence of a pleural effusion of a serofibrinous character. The sputum contains very few bacilli, or may be negative. In primary pleurisy, the onset is more acute and the symptoms are rather stormy, but the pleural syndrome is usually preceded by a period of general impairment of health and mild systemic symptoms. In many cases a careful and repeated physical examination and a radiographic study of the visible parts of the lung, the appearance of bacilli in the sputum, or an unexpected haemoptysis will point to a pulmonary involvement which is often accompanied by a second elevation in the temperature curve. The withdrawal of fluid and its replacement by air will make greater portions of the lung visible, and are useful in detecting the parenchymatous lesion which is usually located below the former high fluid level. The further course in these cases of pleuropulmonary tuberculosis is typically mild and the prognosis is decidedly favorable. With absorption of the fluid, the temperature returns to normal and all objective and subjective symptoms subside within a few weeks. Radiographically, a most remarkable tendency to extensive fibrosis in both lung and pleura is observed. In the latter, the formation of broad adhesions soon leads to an extensive pachypleurisy, such as seen after an obliterating artificial pneumothorax, which is in striking contrast to the circumscribed adhesions which develop in other forms of pleurisy. The altogether favorable course is explained not so much by the mechanical factor of compression, or an increase in antibodies in the pleural fluid, but to a great extent by the intensive fibrotic reaction which starts from the pleural layers and extends to the adjacent portions of the pulmonary parenchyma. In exceptional cases, the fluid may, in spite of adhesions, reappear and even undergo suppuration, or the focus in the lung may follow a progressive but on the whole slow and torpid development. The treatment of choice is artificial pneumothorax, which is of both diagnostic and therapeutic value. The formation of adhesions, however, renders the maintenance of pneumothorax very difficult and total obliteration of the pleural space cannot be prevented even by the use of high pressures. Several case reports with radiographs are presented as examples of this clinical entity which is characterized by the simultaneous involvement of the pleura and adjacent pulmonary parenchyma by the benign course and the marked tendency to extensive fibrosis.—*La tuberculose d' emblée pleuro-pulmonaire, L. Bernard and M. Biderman, Rev. d. l. Tuberc., November, 1931, xii, 1045.*—(*K. F.*)

Epituberculosis.—Three infants presenting the syndrome of epituberculosis with recovery are reported. In one of the cases aspiration of the lung lesion on two occasions at different sites resulted in the withdrawal in the exploring needle of a small amount of caseous material which by smear and guinea-pig inoculation was found to contain tubercle bacilli. This evidence suggests that the whole lesion in so called epituberculous infiltration is a caseous process rather than merely an allergic reaction surrounding a small primary tuberculous focus.—*Benign Tuberculous Infiltration of the Lung (Epituberculosis), J. C. Spence, Arch. dis. Child., February, 1932, vii, 1.*—(*M. D.*)

Pulmonary Infarction and Embolism.—Pulmonary embolism and infarction are not uncommon complications after fracture of or operations on the lower extremities. Nine cases occurred in an orthopaedic service

in a general hospital during a single year. One case presented the classical picture of fatal pulmonary embolism and the other eight showed varying degrees of pulmonary infarction. One of these cases was verified at autopsy. Of the 7 nonfatal cases of pulmonary infarction, 6 followed fractures. All but one of these showed a fracture of a lower extremity, while one followed a fracture of the fifth lumbar vertebra. Three of these fracture cases were treated by insertion of a Steinman pin. During the same period, the authors have had frequent evidence of minor fat embolism, without clinical symptoms, demonstrated by the presence of fat in the urine and occasionally in the sputum, but only one of the fracture cases manifested clinical signs of fat embolism. It has been commonly accepted that the origin of the embolus is from a primary thrombosis, which is found most frequently in the femoral, iliac or pelvic veins. The primary thrombus is not always discovered, even with the most careful autopsy. A systematic examination of large venous trunks proves that quite often thrombosis occurs without complete obstruction and consequently without clinical phenomena permitting its recognition during life. Clinically recognizable femoral thrombophlebitis, while it assists in confirming the diagnosis of infarction, frequently becomes apparent some days after the infarction. Its appearance renders the probability of subsequent fatal pulmonary embolism unlikely. The interval between fracture and infarction is longer than between operation and infarction. Local massage or active motion should be withheld in any fracture case presenting pleural pain, unexplained afternoon fever around 100°F., or bright blood in the sputum. Oxygen administered by tent is useful in allaying respiratory embarrassment and distress in moderate sized pulmonary infarctions.—*Pulmonary Infarction and Pulmonary Embolism in Orthopedic Surgery, C. E. Badgley and E. J. Smith, J. Am. M. Ass., February 6, 1932, xcviii, 467.*—(*G. L. L.*)

Azygos Lobe of Lung.—An azygos lobe, confirmed at autopsy, cast a uniformly dense shadow of the right upper lobe to the right of the trachea and delineated by a sharp lateral border.—*Azygos Lobe of the Right Lung, S. Brown and M. Braverman, Radiology, September, 1931, xvii, 575.*—(*T. O. R.*)

Cellular Reactions in Tuberculosis.—Recent methods for studying living cells of blood and connective tissues have opened up a new period in experimental pathology. The first studies were made with the so called vital staining of cells, in which dyes were repeatedly injected into the living animal. Since they reached the cells in the form of particulate matter, they were a gauge of phagocytic activity. The dyes used in the supravital technique have a more complex reaction. They are applied to living cells which have been taken from the body. Their use gave a sharper differentiation of monocytes from granulocytes and lymphocytes than had been obtained with fixed films. It has been determined that the typical epithelioid cell is a modified monocyte. The living epithelioid cell is characterized by a large rosette occupying the centre of the cell and thus accentuating the position of the centrosphere; this rosette is made up of the same type of vacuoles that characterize the monocyte. The changes in the blood-cells of the rabbit, infected intravenously with one milligram of bovine tubercle bacilli, proved to be remarkably constant. First occurred a sharp rise in the number of monocytes on the second day after inoculation. During the third and fourth weeks there was a decrease in the number of elements arising in the bone-marrow due to the extensive invasion by tubercu. .s tissue. This involvement of the marrow followed only massive doses of organisms, for it is an organ of high resistance to tuberculosis. In every instance in which the animals survived the immediate acute reaction, the bone-marrow healed. The invariable sequence of this regeneration was first a rise in the number of platelets; second, an increase in haemoglobin: a rise in the number of red cells followed one or two days later and the neutrophiles and basophiles began to increase in number. The last marrow cell to return to normal percentage was the eosinophilic leucocyte. The marrow gradually passed into a state of hyperplasia, with red cells and neutrophilic leucocytes both at a higher level than in the original control period. This phenomenon is probably the overcompensatory reaction to the induced hypoplasia, since it involves the red cells as well as the granulocytes. The specific reactions of the blood-cells to tuberculosis are shown by the two strains, monocytes and lymphocytes. In general, changes in the lesions are reflected by the monocytes; in the resistance of the animal, by the lymphocytes. Corresponding to an extensive development of epithelioid cells in the tissues, monocytes flood out into the blood-stream. The later decrease in the monocytes in the blood corresponded to a period in which the early extensive, diffuse reaction of the tissues showed some regression. There has been an increase in leucocytes which correlated with the regeneration of the bone-marrow and a rise in number of monocytes correlated with the increase in

tuberculous lesions in the tissues. Only the animals with good resistance have shown a rising curve of lymphocytes. The ratio of monocytes to lymphocytes in the peripheral blood was an important index of the condition of the animal. The monocyte bears a specific relationship to tuberculosis, not only because it is the forerunner of the cell which is the structural unit of the tubercle, but also because it is probable that the tubercle bacillus is able to survive for long periods of time within this cell. Lymphocytes, on the other hand, appear to be correlated to the state of general resistance of the animal. The problem of resistance in tuberculosis is one of extreme complexity. It has been proved that the virulence of a given strain of tubercle bacilli may be varied by cultural conditions; the organism has an exceedingly complex life-cycle with non-acid-fast as well as acid-fast phases; the dissociation of a given strain may give rise to two organisms, which produce two entirely different types of disease, not to mention all of the relatively fixed types of tubercle bacilli and the intermediate strains of organisms to which species of animals are so differently susceptible. It is generally conceded that resistance is only relative and that an adequate amount of resistance can be acquired, but, perhaps, only through infection. The disease set up by the tubercle bacillus differs from the response to most other pathogenic bacteria in that it is a very chronic new growth of connective-tissue cells quite specific in character. The essential element, the epithelioid cell, can be produced by dead bacilli quite as characteristically as by the living organism. An attempt has been made to find out which factors of the disease can be reproduced by chemical fractions isolated from tubercle bacilli. None of the primary substances from the tubercle bacillus has proved inert. The proteins have been found to be so definite a stimulant for plasma cells as to make possible the study of their complete life cycle. The polysaccharides damage leucocytes and therefore give excellent material to follow their destruction by clasmatocytes. Neither of these two groups of chemical substances has ever produced tubercles. By means of the lipoid fractions it has been possible to produce tubercles similar to those of the infection and to those produced by dead tubercle bacilli. Part of the lipoid gives the property of acid-fastness to the bacilli. Another part of the lipoid, which had none of the property of acid-fastness, was found to be a phosphatide. It proves to be a remarkable stimulant for epithelioid cells. It is a material suitable for the study of the relationship between monocytes and clasmatocytes, which is one of the most difficult problems in connection with the cells of the connective tissues. Evidence shows that clasmatocytes and monocytes are both derived from the same primitive stem-cell; that they are very closely allied functional strains and have many characteristics in common; that the monocyte of the blood and connective tissues appears to be a mature functioning strain; that it is possible that the monocyte may become a clasmatocyte, but that, on the other hand, the clasmatocyte may arise from the primitive cell without passing through the monocytic phase; that under experimental conditions it can be shown that monocytes may react to certain stimuli to which adjacent clasmatocytes appear to be inert; that in these reactions the monocytes have what may be termed the epithelioid type of intracellular chemical reaction markedly developed. The tuberculophosphatide gave also an opportunity to restudy the relationships of giant cells produced in the connective tissues by the reaction to foreign bodies. Both the epithelioid giant cells and the type specifically called the foreign-body type are a reaction to foreign material. In the one case, the phagocytosis of some material by a single cell has produced a large central rosette, which determines a peripheral position of multiple nuclei formed by amitosis; in the other case, many cells surround foreign material and fuse into a single mass in the effort to deal with it. The results of experiments on the effects of increasing and decreasing monocytes are not against the concept that the epithelioid cell is not a protective mechanism for the host. Methods for increasing lymphocytes have been applied to the study of resistance in tuberculosis. X-rays in properly graded doses and intravenous injections of foreign protein have caused lymphoid hyperplasia with a marked increase in the proportion of immature lymphocytes in the circulating blood.—*Cellular Studies in Tuberculosis, F. R. Sabin, Tubercle, February, 1932, xiii, 206.*—(*M. E. P.*)

Experimental Pulmonary Fibrosis.—The worker in a dusty atmosphere of the dangerous trades is unharmed as long as the dust can be satisfactorily removed by the cilia of the upper part of the respiratory tract, and he becomes injured when that mechanism of protection breaks down and dust reaches alveoli. Experiments on the aspiration of particulate matter into the lung proved that it is possible to produce, within a brief period, comparable loss of competency in the normal defense mechanism in an animal. *Experiments:* In this study the dog lay on an inclined plane, with the head of the table elevated 10 cm. higher than the

foot. The head was held to one side. Forty cubic centimetres of a mixture of 20 per cent barium and india-ink were given in doses of 5 cc. every 5 minutes. It was dripped into the mouth and allowed to flow down the cheek. The dog was kept anaesthetized with ether throughout the experiment and the suction of the inspiration was the only force employed to transport the suspension of the particles down to, and through, the trachea into the lungs. At the conclusion of the experiment, the dog was dispatched by overetherization and necropsy was done at once. Within the hour taken to perform the experiment, particulate matter had been placed as deeply in the lung as any dusting experiment could have placed it in months and probably as deeply as man would have inhaled it after even years of exposure to an atmosphere heavy with the dusts considered dangerous in industry. By overcoming the first protection afforded by the cilia of the upper part of the respiratory tract, the first stage of the second protective mechanism was observed. This is called into service when dusts can no longer be removed by ciliary transportation of dustladen mucus. The second stage of protection depends on the ability of the lung to repair injury after the first mechanism has been overcome. The defense reaction is taken up by the mesenchyme, and the offending foreign bodies are destroyed or removed from the organ through the lymphatic structures, or are stored in depots where they are so invested that they do the minimal amount of harm. The process is, first of all, one of phagocytosis; later, one of lymphatic drainage; and, finally, one of fibrosis to encapsulate what cannot be removed. With the breakdown in the carrying mechanisms, the burden of protection is the phagocytic cell, which, with its load of engulfed material, passes to all parts of the lung and ultimately becomes immobilized in those portions of the parenchyma in which lymphatic tissue is abundant. The cells concerned are polymorphonuclear leucocytes which are the first to appear, to disintegrate and to disappear, and clasmatocytes, which appear later, are extremely active, break up less readily, and may become transformed into fibroblasts. In association with the tissue fibroblasts the clasmatocytes form scar-tissue. Fibrosis is the result of the action of substances secreted by the cell on the foreign particles. If a tissue poison results from this chemical action, fibrosis is encouraged, and is progressive, lasting as long as the unaltered irritant remains in the lung.—*Pulmonary Fibrosis: Experiments of Short Duration, W. S. Lemon and G. M. Higgins, Am. J. Med. Sc., February, 1932, clxxxiii, 153.*—(*W. I. W.*)

Pulmonary Circulation.—It is well known from experimental and clinical observations that the pulmonary circulation is easily adapted to varying requirements. It is not known, however, by what mechanism this adaptation is achieved. Two different types of vascular mechanisms are known to occur. The peripheral skin capillaries are known to have active contraction and dilatation. The capillaries in the kidneys and in the liver do not perform active changes of their volume, but their blood-stream is regulated by contraction and dilatation of their precapillary arterioles. It is known that during rest some capillary beds in the lung are empty. This is probably closely related to the so called physiological atelectases. When the vascular bed of the lung is decreased by tying one lobe or by pneumothorax with positive pressure, all the capillaries in the rest of the lung show an active blood-stream. In order to study the regulating mechanism of the capillaries surviving lung preparations from the frog were studied. It was found that there was always a capillary pulse, which is probably explained by the fact that the major arteries are rapidly split up into the capillary system. One alveolus is supplied by more than one capillary, and the functional state of all capillaries belonging to one alveolus is not necessarily the same at a given moment. The arterioles contract and dilate very actively, and during their contraction the capillaries remain open although devoid of blood. It was never possible to cause a contraction of the capillaries themselves. Mechanical and electrical stimuli were equally unsuccessful. Pharmacological stimuli did not influence the capillaries, and not even histamine seemed to influence them directly. Only when the blood-pressure in the pulmonary circulation is much increased was it possible to demonstrate an apparently passive dilatation of the capillaries. This functional difference between visceral and cutaneous capillaries is probably explained by the fact that the former have a different function, inasmuch as they are not the capillaries provided for the metabolism of their respective organs. This function is performed in the lung by the bronchial vessels, while the pulmonary capillaries serve the metabolic needs of the entire body. The optimal circulation occurs when the lung is fully expanded. Circulation occurs only in air containing alveoli. With decreasing air-content circulation decreases. In excessive inflation, beyond the physiological limits, circulation decreases. With changes in the air-content of the lung the topographical relations between capillaries and alveolar walls change in such a way that the capillaries are closest to the alveolar surface when

the lung is optimally expanded. In this physiological phase the surface of the capillaries is greatest. With increased function the circulation, then, is at its optimum in regard to the blood-flow, the position of the capillaries and the size of the capillary surfaces.—*Über die Aktivität der Gefässe im Lungenkreislauf, Tiemann, Klin. Wchnschr., January 23, 1932, xi, 140.*—(*M. P.*)

Absorption of Gas.—The absorption, transportation and elimination of gases in the living body have long been subjects of theoretical interest and extensive investigation. The development of atelectasis is explainable on well-established principles of physiology. The forces involved are essentially the same as those that control the diffusion of gases in normal respiration. The same principles and forces account also for the absorption of air from a pleural space in a therapeutic pneumothorax, and for the absorption of gas from any space in the body. The pressure of oxygen in venous blood is about 60 mm. lower than in arterial blood. The pressure of carbon dioxide is only about 6 mm. higher in venous than in arterial blood. On this account the total gas-pressure in venous blood is always considerably less (60 − 6 = 54 mm.) than the total gas-pressure of the atmosphere on the exterior of the body. The pressure of air in the lungs and the atmosphere on the outside of the body compresses any gas-filled cavity, such as an occluded lung or pleural space, until the total gas-pressure within is nearly the same as that of the atmosphere. This pressure is therefore higher than the total gas-pressure in the venous blood. Each gas then diffuses into the blood at a rate dependent on its own partial pressure, its solubility and the capacity of the blood for it. As rapidly as gas is absorbed, the cavity is compressed by the pressure of the atmosphere on the soft tissues. As oxygen and carbon dioxide are absorbed quite readily, the partial pressure of nitrogen in the occluded air is thus raised above the pressure of this gas in the blood, and it gradually diffuses and is carried away by the blood. The rapidity of absorption is determined by the vascularity and surface area of the part. In the absorption of gases, blood-pressure is not at all involved. The only forces acting are the pressures of the gases in the occluded space and in the blood, and the atmospheric pressure in the normal parts of the lungs and on the exterior of the body. During normal breathing there are in the alveolar air of the lungs (partial) pressures of about 100 mm. of oxygen, 40 mm. of carbon dioxide, and 570 mm. of nitrogen, plus 50 mm. of water vapor. As air passes freely in and out of the lungs, the total gas-pressure in the alveoli is necessarily that of the outside air, or 760 mm. The blood flows from the lungs to the left side of the heart and on into the arterial system containing oxygen, nitrogen and carbon dioxide at almost exactly the same pressures that these gases have in the lungs.—*The Absorption of Gas from any Closed Space within the Body, Particularly in the Production of Atelectasis and after Pneumothorax, Y. Henderson and M. C. Henderson, Arch. Int. Med., January, 1932, xlix, 88.*—(*W. I. W.*)

Bacteriology of Tubercle Bacillus.—Smears of tubercle bacilli, stained according to the Ziehl method, will not infect guinea pigs, either on first or second animal passage when scraped from the slides and injected subcutaneously into the animals. Occasionally guinea pigs inoculated with tubercle bacilli, or with material containing tubercle bacilli, are found to be noninfected when examined routinely at autopsy, whereas certain organs and lymph nodes of these animals, when injected subcutaneously into a second series of animals, may lead to tuberculous infection, or, when transferred to suitable media, may develop pure cultures of tubercle bacilli. It is not necessary to postulate a filterable form, or an avirulent type of tubercle bacillus to explain these results. The failure of the first animal passage can be attributed to an infecting dose too small to produce bacteriological infection demonstrable by ordinary laboratory methods within the time interval commonly allotted, but of sufficient size to produce an infection which can be readily recognizable after the lapse of time necessary for second animal inoculation, or for growth on suitable culture media.—*Beitrag zur Bakteriologie des Tuberkelbazillus, A. Grumbach, Schweiz. med. Wchnschr., May 21, 1932, lxii, 493.*—(*V. T.*)

Action of Iodine on Acid-Fast Property of Tubercle Bacillus.—Metallic iodine and hydriodic acid render tubercle bacilli of human, bovine and avian strains non-acid-fast. If applied before fixation to smears of tubercle bacilli or to sputum containing them, they inhibit the acid-fast reaction; if the bacilli have been stained according to the usual method, they are decolorized by these substances. An old 10 per cent tincture of iodine has a similar effect because it contains both metallic iodine and hydriodic acid. Higher dilutions of the same tincture, or freshly prepared solutions of full strength, have only slight influence on the acid-fast reaction, due to the paucity of the necessary iodine compounds. Older cultures of tubercle bacilli are more susceptible to this action of iodine.—*Action annihilante*

de l'iode sur l'acido-resistance du bacille de Koch, S. Marbais, Schweiz. med. Wchnschr., April 16, 1932, lxii, 377.—(V. T.)

Mutation of Bovine Tubercle Bacilli.—It is suggested that bovine bacilli introduced into the alimentary system in childhood may remain dormant in the mesenteric lymph nodes for a period of ten to fifteen years, in the meantime slowly assuming in human tissues the characteristics of human bacilli. By direct lymphatic extension, or by the lacteals, these bacilli may be conveyed to the bronchial lymph nodes and cause pulmonary tuberculosis. If this is true, it is obvious that, by directing energies to the prevention of bovine infection through milk, all forms of surgical tuberculosis may be eradicated, and many cases of pulmonary tuberculosis prevented.—*Human and Bovine Tuberculosis; the Question of Mutation of the Tubercle Bacillus, N. Raw, Brit. M. J., February 27, 1932, no. 3712, 377.—(M. E. P.)*

Epidermal Tuberculin Reaction.—It was shown by Kentzler and Kallós that patients with active tuberculosis and hypofunction of the thyroid do not react, or react weakly to tuberculin, and that after a sufficient amount of thyroid medication, the tuberculin reactivity is much increased. Lucacer stated that a previously negative epidermal tuberculin reaction in tuberculous patients could be made positive by adding thyroxin to the tuberculin used for the reaction. While a minimum of 7 mgm. of thyroxin was found necessary to restore a normal tuberculin reaction in patients with hypothyroidism, in Lucacer's experiments not more than 1 mgm. was necessary. The thyroxin used in these experiments is preserved in a 0.01 normal sodium hydroxide solution. It was demonstrated in serial examinations that the increase in the epidermal tuberculin reaction is due to the alkali solvent which makes the epidermis more permeable, and not to the thyroxin itself. As reported previously, the epidermal tuberculin reaction without scarification of the skin is found positive only in patients with skin tuberculosis.—*Über den Einfluss von Thyroxin bzw Kalilauge auf die Tuberkulinhautreaktion, P. Kallós and W. Müller, Klin. Wchnschr., March 19, 1932, xi, 504.—(M. P.)*

Purification of Tuberculin.—Many efforts have been made to modify or purify Old Tuberculin, but most of these have been unfruitful. The Sauton tuberculin, made from human bovine tubercle bacilli, is "twenty one times purer" (more concentrated?) than Old Tuberculin. It is a brown powder, 0.3 mgm. of which is lethal for a tuberculous guinea pig. Large doses of it do not affect normal guinea pigs when injected. Dialysis of this product separates the fraction which produces the skin test from that which produces death in animals. Approximately 100 skin doses correspond to a lethal dose in the undialyzed product.—*Die Reinigung von Tuberkulin und seine Auswertung, E. Küster and E. Maschmann, Deutsche med. Wchnschr., August 28, 1931, lvii, 1497.—(H. S. W.)*

Early Diagnosis of Pulmonary Tuberculosis.—Approximately 75 to 85 per cent of all patients with pulmonary tuberculosis are diagnosed when they have already a positive sputum. There are three possibilities to explain this condition: (1) Tuberculosis may not in a high percentage of cases start as open tuberculosis; (2) the tuberculous patient seeks medical advice while his lesions is still closed but his disease is not recognized in time; and (3) the tuberculous patient comes too late for his first examination. Many patients with open tuberculosis claim to have been ill for only a short time. But, on more careful questioning, one finds that many of these patients have not felt quite well before the onset of more definite symptoms. The fact that many patients are not properly diagnosed when they first seek medical advice is supported by a good deal of evidence. The percentage of erroneous diagnoses in regard to pulmonary tuberculosis is excessively high. The cause of this condition is the fact that the criteria for incipient pulmonary tuberculosis are essentially wrong and the fact that incipient lesions cannot be diagnosed correctly without roentgenological examination. Many cases of pulmonary tuberculosis begin without producing any symptoms whatsoever,—*tuberculosis inappercepta.* It should be emphasized that whenever a suspicion of tuberculosis exists a roentgenological examination is necessary to exclude or to make the diagnosis. The frequency of asymptomatic pulmonary tuberculosis can only be ascertained by examining large numbers of people who are subjectively well. This may be done in so called contact examinations, examinations of certain groups of the population, such as students, soldiers, inmates of homes, etc., or by examination of single individuals who are believed to be healthy. In the course of such examinations 0.5 to over 12 per cent of individuals have been found to have unsuspected pulmonary tuberculosis. The highest figures are found, of course, in contact examinations. They are therefore of particular importance and should be enforced whenever possible. The term of contacts should not be restricted to residential contacts, but should include schools where

tuberculous pupils or teachers have been found, work-shops and factories. Certain groups of the general population which are known to be particularly endangered should be regularly examined, such as descendants of tuberculous parents, workers in dusty trades, teachers, nurses, sickly children and domestic servants. It would be desirable to have regular examinations of all students at the end of high-school, of students and soldiers. The most dangerous age for girls is from 15 to 20 years and in boys from 18 to 20 years. Individual examinations should be made on all patients entering hospitals and particularly on all undergoing operations. The same is true of all inmates of insane asylums and of patients following trauma. No health certificate should be granted without X-ray examination. Studies on apparently healthy individuals have contributed a good deal of knowledge to the actual inception of pulmonary tuberculosis. They have shown that more than two-thirds of all cases do not begin in the apices while only few cases progress rapidly to severe destructive processes. There are but few which healed within three years. Pulmonary tuberculosis in patients 10 to 30 years of age is prognostically much graver than in children between 1½ and 8 years. This discussion is illustrated by a rich statistical material. It is concluded that practically every clinical tuberculous disease is preceded by an asymptomatic period during which, however, X-ray evidence of the disease exists.—*Das Rechtzeitige Auffinden der Lungen-Tuberkulose und die Tuberculosis Inappercepta, Braeuning, Klin. Wchnschr., March 5, 1932, xi, 401.*—(*M. P.*)

New Method for Viewing Chest X-Rays.—This new method is especially applicable to roentgenograms made at a distance of 6 feet or more. The film, after being placed in a viewing box with the usual lighting intensity, is examined by the observer 15 to 20 feet distant from the film with the aid of opera glasses which have lenses of the highest quality. This method is especially convenient for the study of films displayed at meetings.—*A New Method for Studying Chest Films, H. G. F. Edwards, Radiology, September, 1931, xvii, 581.*—(*T. O. R.*)

Roentgenology of Metastatic Pulmonary Growths.—Metastatic pulmonary lesions may be the result of direct, haematogenous, or lymphogenous extension. Usually these metastases are found by roentgenological examination before there is demonstrable clinical evidence. The symptoms, in order of frequency, are a dry, hacking, unproductive cough, constant and progressive dyspnoea, pain, haemoptysis, night-sweats, and cyanosis. Roentgenologically lesions of the parenchyma may be nodular, which may be miliary or involving the greater portion of one lobe, or infiltrative with the appearance of wet snowflakes. Lesions of the lymph nodes may show mediastinal enlargement. Lesions of the pleura usually cause an effusion which is indistinguishable from pleurisy with effusion due to other causes. Pulmonary neoplasms secondary to carcinomata of the breast are the most common. Of 90 cases, 12 per cent had no demonstrable parenchymal involvement, 83 per cent had bilateral involvement, and 17 per cent had unilateral with a slight preponderance of right-sided involvement. In 35 per cent there was an accompanying pleuritic exudate on one or both sides. Infiltrative lesions were almost as frequent as the discrete nodular type. The high incidence of pleural involvement suggests that frequently the secondary pulmonary involvenent is the result of direct extension from the original lesion. Metastatic lesions from malignant tumor of the male or female generative tract occur next in frequency. Testicular tumors produce definitely circumscribed parenchymal pulmonary lesions which are usually bilateral. In 20 per cent of the cases there were infiltrations at the root. Pleural effusion was found in one case. These pulmonary metastases grow remarkably rapidly. Metastases from carcinoma of the prostate produce bilateral, fairly well-circumscribed pulmonary lesions. Neoplasms of the urinary bladder may produce unilateral or bilateral metastases. Regarding neoplasms of the female generative tract, it was found that epithelioma of the cervix usually produced bilateral, definitely circumscribed pulmonary metastases. Lesions secondary to cystadenoma of the ovary produced a pleuritic exudate in most of the cases. Carcinoma of the stomach rarely, while carcinoma of the large bowel more frequently metastasizes to the lung. In these cases there was an almost equal division between unilateral and bilateral lesions. The pulmonary metastases of carcinoma of the kidney were usually bilateral and well-circumscribed. These may be accompanied by hilar or mediastinal thickening. Pulmonary lesions secondary to tumors of bone showed no distinctive features. Pulmonary metastases from malignant conditions of the skin were more frequent than usually expected. In melanoepitheliomata there was a greater tendency to definitely circumscribed lesions while squamous-cell epitheliomata tended to infiltrative lesions. In both cases there was a predominance of bilateral involvement. The mediastinal and hilar thickening found secondary to carcinoma of the thyroid gland

suggests progression of the original lesion by direct extension. Definite parenchymal involvement is usually present as well. To make a positive diagnosis of pulmonary metastases the roentgenologist should know the history and physical condition of the patient.—*The Roentgenologic Study of Pulmonary Metastatic Growths, B. R. Kirklin and H. C. Ochsner, Radiology, September, 1931, xvii, 435.*—(*T. O. R.*)

X-Ray Diagnosis of Pleural Effusions.—Postmortem roentgenograms, made routinely at Fitzsimons General Hospital, failed to detect certain large pleural effusions, though demonstrated at autopsy. In these same cases the clinician also failed to diagnose the presence of fluid. Analysis of the roentgen features of pleural effusions led to the following conclusions: The great absorptive power of fluid for the roentgen ray causes a dense, homogeneous shadow; the elasticity and capillary action of the pleura which must overcome the cohesive force that is nonoperative in the cadaver cause the fluid to spread in a thin film over the entire lung; the pull between gravity and the elastic tension of the lung causes the unique configuration of the shadow. A study of a large series of roentgenograms with autopsy findings of pleural effusion, in an effort to estimate the amount of free fluid present and the amount necessary to cast a diagnostic shadow, revealed a lack of agreement between films and findings. The elasticity and compressibility of the lung have a definite relation to the appearance of the fluid, lack of the latter causing it to rise much higher. Attempts to produce pleural effusions in the cadaver were unsuccessful because of the absence of vital factors necessary to produce the typical configuration. Lateral chest plates sometimes demonstrate small effusions. The inability in certain cases to demonstrate effusions as large as 400 cc. either by physical or roentgen examination is due to the distribution of the fluid which is dependent upon a combination of physical factors not yet completely explained.—*Quantitative Roentgen Diagnosis of Pleural Effusions, A. Bowen, Radiology, September, 1931, xvii, 520.*—(*T. O. R.*)

X-Ray Diagnosis of Early Infiltration.—Physical examination of the chest may overlook small areas of tuberculosis, both indurative and with cavity, if they are situated deeply. Therefore, an X-ray examination is absolutely necessary for a complete investigation of the patient. The X-ray has revealed a few forms of pulmonary tuberculosis that were often undetectable before the roentgenological era. For instance, widespread haematogenous (miliary) tuberculosis and the so called early infiltration are revealed by the film when usually the physical examination does not detect them. Clinically the latter resembles grippe. In this condition it is highly important to examine the sputum carefully and repeatedly by both direct smear and culture. The sedimentation rate of the red cells is accelerated and there is a "shift to the left" in the haemogram. This type of tuberculosis represents about 20 per cent of all cases of pulmonary tuberculosis.—*Fortschritte auf dem Gebiete der Diagnose der Lungentuberkulose, Schulte-Tigges, Deutsche med. Wchnschr., September 11, 1931, lvii, 1583.*—(*H. S. W.*)

Intrathoracic Localization by Stereoroentgenography.—Various types of distortion as they appear in stereoscopic chest roentgenograms have been made the subject of experimental observation. Unless the exposure be taken with the optimal tube shift and distance and unless the viewing apparatus be properly adjusted and correctly used error creeps in. Error may be due also to cardiac and respiratory movement, or movements of the trunk as a whole; the last two of these are controllable. Cardiac movements are quite variable and, if adhesions are present, frequently interfere with any localization around the heart. The type of distortion depends upon the relative phase of the cardiac cycle at the instant of exposure.—*On Intrathoracic Localization by Stereoroentgenography, with a Consideration of the Sources of Error, H. C. Sweany, R. Kegerreis and C. E. Cook, Radiology, February, 1932, xviii.*—(*T. O. R.*)

Tubercle Bacilli in Blood.—In a series of cases of tuberculosis Loewenstein's procedure yielded a fair percentage of positive cultures. Tubercle bacillaemia may be the cause or the result of acute, often undiagnosed, tuberculosis. In 17 cases of active tuberculosis there were 3 positive blood cultures. In 44 rheumatic patients, 7 yielded tubercle bacilli in blood culture, and in 39 cases of sepsis, grippe and other diseases the blood cultures of 9 contained tubercle bacilli. In one case that died of influenzal pneumonia, autopsy revealed tuberculosis of a bronchial lymph node. One died of miliary tuberculosis. Both had tubercle bacilli in the blood. Blood culture revealed tubercle bacilli in 4 of 7 cases of sepsis from various foci, including the tonsils. It appears that tubercle bacilli may occur in the blood frequently in the course of acute febrile diseases and may be (frequently) only an expression of a transient exacerbation of a quiescent tuberculous process.—*Die klinische Bedeu-*

tung des Tuberkelbazillennachweises im Blut, L. Popper, Deutsche med. Wchnschr., January 15, 1932, lviii, 89.—(H. S. W.)

Tubercle Bacilli in Blood.—Search for tubercle bacilli in the blood was made by Loewenstein's method as follows: 4 patients with miliary tuberculosis and tuberculous meningitis, 2 with tuberculous lymphoma adenitis, 2 with renal tuberculosis, one with osseous tuberculosis, 30 with far-advanced pulmonary tuberculosis with cavity, 5 with infectious arthritis and 5 with multiple sclerosis. Blood cultures from all these patients yielded tubercle bacilli in two patients with miliary tuberculosis and in two with far-advanced pulmonary tuberculosis, but in no others. This is a much lower incidence than one might expect from Loewenstein's reports. The latter's technique was followed strictly and no satisfactory explanation for the discrepancy can be offered at this time except that the technique is a very delicate one.—*Zur Frage der Tuberkelbazillenzüchtung aus dem Blute nach E. Loewenstein, W. Ederle and H. Kriech, Deutsche med. Wchnschr., January 1, 1932, lviii, 7.—(H. S. W.)*

Tubercle Bacilli in Blood.—Following Loewenstein's technique 115 blood cultures were taken on 106 patients manifesting varied clinical forms of tuberculous infection. At the end of six weeks no growth had occurred either on macroscopical or microscopical examination.—*Untersuchuhgen über den Nachweis von Tuberkelbazillen im strömenden Blut nach Löwenstein, H. Dettling, München. med. Wchnschr., April 1, 1932, lxxix, 541.—(V. T.)*

Negative Blood Cultures in Tuberculosis of Skin.—Blood cultures, à la Loewenstein, turned out to be negative in 12 cases of lupus vulgaris, 2 of *granuloma annulare*, 2 of erythema induratum 4 of lupus erythematosus, 4 of tuberculosis cutis verrucosa and one of epididymitis. These cultures were negative grossly and upon microscopical examination of smears made from the surface of the medium.—*Tuberkelbazillämie bei Hauttuberkulosen? F. Koch, Deutsche med. Wchnschr., January 15, 1932, lviii, 90.—(H. S. W.)*

Elusiveness of Tubercle Bacillus.—It is important to have frequently repeated microscopical and cultural examinations of the sputum and more particularly repeated animal inoculations in many cases of pulmonary catarrh and fibrosis, before excluding, on bacteriological grounds, the possibility of the lesion being tuberculous. Five cases are reported in which repeated microscopical and cultural examinations failed to reveal the tubercle bacillus, but repeated guinea-pig inoculations ultimately proved the presence of tuberculosis.—*On the Occasional Elusiveness of the Tubercle Bacillus in Gross Lesions, W. M. Cumming and W. M. Foster, Tubercle, April, 1932, xiii, 289.—(M. E. P.)*

Serological Differentiation between Tuberculosis and Syphilis.—Complement-fixing antibodies against tubercle bacilli can be completely removed from the serum by tubercle bacilli; beef-heart extracts, however, do not change the antibody content. In Wassermann-positive sera absorption can be achieved by beef-heart extracts but not by tubercle bacilli. The results of these experiments are interpreted to prove the antibody nature of the complement-fixing substances in tuberculosis and syphilis sera. Furthermore, this method permits of a serological differential diagnosis in such sera which react with both antigens.—*Zur serologischen Differentialdiagnose zwischen Tuberkulose und Syphilis, E. Witebsky and R. Klingenstein, Klin. Wchnschr., January 16, 1932, xi, 100.—(M. P.)*

Serological Differentiation between Syphilis, Gonorrhoea and Tuberculosis.—Careful studies on a human serum which gave positive complement fixation with tuberculosis, gonorrhoea and Wassermann antigens showed that the specific antibodies can be absorbed by the respective antigens without diminishing the antibodies for the other antigens. In this particular case it was possible to demonstrate by this method of specific absorption that all three antibodies were separately and independently present. The clinical diagnosis of the patient was papular syphilide of the hand, recent gonorrhoea with positive bacteriological findings, no clinical tuberculosis, although the history shows opportunities of infection.—*Zur serologischen Differentialdiagnose zwischen Syphilis, Gonorrhöe und Tuberkulose, E. Witebsky, Klin. Wchnschr., January 20, 1932, xi, 194.—(M. P.)*

Complement Fixation in Tuberculosis.—Experience with a new tubercle-bacillus extract (I. G. Farbenindustrie) in determining complement fixation indicates that this product has advantages. It yields reactions in as high as 80 per cent of patients with tuberculosis, while in 525 persons not having tuberculosis the sera were positive in only 4 per cent. Theoretically the reaction may be compared in its specificity to the tuberculin test, for the reaction may be positive by each method when mere infection

is present as well as when clinical signs of disease are manifest. Curiously enough, however, these two tests do not always coincide in a given patient. The explanation of this is not clear. A positive serum reaction may indicate immunity. In markedly progressive tuberculosis in the end-stages of the disease there is a serological anergy. The test has proved of value in visceral and lymphatic tuberculosis and in the diagnosis of vague febrile conditions, tumor and vague abdominal disturbances. Examination of 45 exudates and fluids by this method has likewise proved helpful.—*Zur Komplementbildung auf Tuberkulose, F. O. Höring, Deutsche med. Wchnschr., February 12, 1932, lviii, 251.*—(*H. S. W.*)

Multiple-Puncture Tuberculin Test.—The author has devised an instrument, consisting of 5 needles with points on a plane, which can be used to perform a standard and reliable multiple-puncture tuberculin test quickly, easily, and with only slight discomfort. It is of particular value when used in children, especially for a routine method applicable to large numbers.—*The Multiple Puncture Cutaneous Tuberculin Test, W. S. Craig, Arch. Dis. Child., December, 1931, vi, 357.*—(*M. D.*)

Sore Throat Masking Tuberculosis.—A sore throat may precede other clinical manifestations of a tuberculous exacerbation and thus conceal the underlying pathological process. The sore throat associated with tuberculous flares differs from true angina in the relative severity of constitutional symptoms as compared to the condition of the pharynx. Subjectively, there is moderate pain on swallowing and malaise. Objectively, the tonsillar lymph nodes are slightly enlarged and the pharynx is somewhat reddened, but the tonsils are little altered and without exudate. The degree of elevation of temperature is variable, but it may be disproportionately high. Pathological studies made of tonsils obtained from a case of this type failed to show any evidence of recent or old tuberculous infection. The hypothesis therefore is advanced that the mild angina found in association with tuberculous exacerbations is a local allergic manifestation.—*"Angina" als Tuberculosemaske, H. J. Schmid, Schweiz. med. Wchnschr., May 21, 1932, lxii, 497.*—(*V. T.*)

Differential Diagnosis between Heart-Failure, Lung and Tuberculosis.—Pulmonary stasis due to myocardial insufficiency, especially in mitral stenosis and insufficiency, may mask the presence of pulmonary tuberculosis, or give physical signs so similar to those found in this disease, even in its advanced stages, that differentiation between the two conditions can be made only roentgenographically.—*Kasuistischer Beitrag zur Differentialdiagnose zwischen der Herzfehlerlunge und der Lungentuberkulose, J. Tillman, München. med. Wchnschr., April 29, 1932, lxxix, 712.*—(*V. T.*)

X-Ray Treatment of Tuberculosis of Eye.—Tuberculin is frequently used in ocular tuberculosis, with good results. When X-ray is used, great care and judgment are required because injudicious use leads to serious damage to the cornea or retina and to the occurrence of cataract and glaucoma. In 6 cases of tuberculous dacrocystitis X-ray led to healing after from three to five exposures. In several instances of retinal haemorrhage, X-ray produced good results. Eight cases of dacrocystitis and 8 of episcleritis and scleritis of tuberculous origin have been healed by minimal doses of radium, and 13 out of 14 instances of corneal involvement disappeared by this means. In 45 cases of iridocyclitis, all but two cleared up, and 18 of 22 cases of choroidoretinitis were healed, but at the end of one year two of these were in a relapse. Choroidoretinitis with ablation tended to recur after treatment. The response of the tissues to X-ray and radium is quite like that to tuberculin, but the effect lasts longer and it leads to better results in productive types of disease. In cases that are so sensitive that tuberculin therapy is contraindicated, ray therapy (X-ray or radium) may be used. In acute, exudative cases radium is more effective than X-ray. The patient with tuberculosis of the eye should be treated in a general way just as the one with pulmonary tuberculosis.—*Die Behandlung tuberkulöser Erkrankungen des Auges und seiner Umgebung mit Röntgen- und Radiumstrahlen, Hoffman, Deutsche med. Wchnschr., August 21, 1931, lvii, 1448.*—(*H. S. W.*)

Cervical Tuberculous Abscess.—The term "collar-stud" exactly depicts the gross pathology of cervical tuberculous abscesses. Clinically, they are most often associated with a limited tuberculous invasion of the upper jugular chain of lymph nodes. It is necessary to exclude the possibility of the swelling being a branchial cyst. Repeated aspiration sometimes cures this condition, but the method is slow and rather uncertain. Twenty-six cases of collar-stud abscess have been treated by excision with satisfactory end-results. Artificial sunlight treatment was commenced soon after operation, and, when there were dental caries and diseased tonsils, these received appropriate attention.—*Tuberculous Cervical Abscess, H.*

Bailey, Brit. M. J., January 2, 1932, no. 3704, 11.—(*M. E. P.*)

Pleurisy and Tuberculosis.—The records of 639 patients with pleurisy seen at the Peter Bent Brigham Hospital were reviewed. One hundred and forty-nine of these were acceptable as instances of acute dry pleurisy. The subsequent history of 40 of the latter during a period averaging seven years has been obtained by correspondence or examination. In four of the patients pulmonary tuberculosis developed, in three of them within one year after the acute pleurisy. The remaining 36 are in good health. While one should appreciate the likelihood that an acute dry pleurisy may be an early manifestation of tuberculous infection, this study suggests that pulmonary tuberculosis does not develop in as large a percentage of cases of dry pleurisy as has been previously taught. —*The Subsequent Course of Forty Patients with Acute "Dry" Pleurisy, M. N. Fulton, J. Am. M. Ass., December 26, 1931, xcvii, 1959.*—(*G. L. L.*)

Intestinal Tuberculosis.—Intestinal tuberculosis is the most frequent complication of pulmonary tuberculosis and is found in from 50 to 80 per cent of even more of all autopsies performed on patients who have died from pulmonary tuberculosis. Eight per cent of 1,801 consecutive patients at the Trudeau Sanatorium had definite intestinal tuberculosis. Suggestive symptoms of beginning intestinal tuberculosis include, among others, any digestive disturbances, marked constipation, failure of the pulmonary condition to improve, an irregular temperature with subnormal fluctuations, possibly decrease of pulmonary symptoms while the patient is no better, alternating diarrhoea and constipation and marked nervousness. As symptoms are so often absent one must turn to the study of the barium meal and enema by roentgen rays to exclude intestinal tuberculosis. The presence of a spasm or spastic filling defects, irregular contour, lack of haustration, failure of the caecum or other parts of the proximal colon to retain barium, generalized hypermotility with complete or almost complete emptying of the colon in twenty-four hours, of confirmed segmentation with dilatation of some coils of the small bowel, ileac stasis and gastric retention are the essential points in the roentgen diagnosis when the intestine is studied at the seventh, eighth, ninth or tenth hours and again at the twenty-fourth hour. Heliotherapy, natural or artificial, relieves the symptoms in a large proportion of early cases. When desired results are not obtained by this method, roentgen or other forms of treatment should be carefully followed. The dietetic treatment, consisting of codliver oil, 1 ounce, and tomato or orange juice, 4 ounces, ice cold, when taken immediately after meals, has apparently cured many cases. Surgical intervention is practised less frequently now than formerly. In early localized lesions, excision is the operation of choice. Medical treatment, when diarrhoea is absent, is of little avail. For diarrhoea, drop doses of creosote in a capsule with one-fourth grain (0.016 gm.) of iodoform, may be tried after meals.—*Diagnosis and Treatment of Tuberculosis of the Small and Large Intestine, L. Brown and H. Sampson, J. Am. M. Ass., January 2, 1932, xcviii, 26.*—(*G. L. L.*)

Tuberculosis of Jejunum.—The jejunum is frequently involved in the terminal stage of an extensive tuberculosis of the bowels. It is rare, however, to find isolated tuberculosis of the jejunum without tuberculosis elsewhere in the bowel. The authors report two cases showing some unusual features, such as the formation of chronic tuberculous hyperplasia in the small intestine, the presence of a single lesion and a single stricture in the jejunum. The diagnosis is often impossible except in cases in which stenosis or partial obstruction of the jejunum has occurred. Tuberculosis of the jejunum is one of the most common causes of jejunal stenosis. This stenosis is frequently the result of healing and fibrosis, is often partial or chronic, and may either be symptom-free or cause mild vague symptoms or more or less violent intermittent attacks of intestinal obstruction. The diagnosis may be divided into three headings: first, the diagnosis of chronic obstruction; second, its location in the jejunum; and, third, its cause, namely tuberculosis. The roentgen examination is very important. Several details are emphasized: the use of "scout" or plain films of the abdomen; the repeated study of the small intestine pattern in the first six hours after a barium meal, since evidence of partial obstruction is apt to be transitory. The treatment of tuberculous obstruction of the jejunum is surgical by choice and medical only by necessity. Lavage of the stomach may give temporary relief, but as the stricture increases surgery becomes a necessity.—*Tuberculosis of the Jejunum, F. W. White and I. R. Jankelson, J. Am. M. Ass., January 2, 1932, xcviii, 23.*—(*G. L. L.*)

Recurring Hypertrophic Tuberculosis of Ileum.—Only 7 cases of hypertrophic tuberculosis of the ileum had been reported up to 1929. Another case was unique in that a second resection of the ileum had to be made shortly after the first. The hypertro-

phic changes developed quite rapidly. The patient had a family background of tuberculosis and exhibited healed apical disease but gave a negative tuberculin reaction. The onset of disease followed an appendicectomy. At first the symptoms greatly outweighed any definite signs. Except for occult blood in the stools, special examinations were essentially negative. Symptoms suggested some degree of intestinal obstruction. A first exploratory laparotomy revealed an indurated tuberculous process constricting the first part of the ileum. An 8-inch loop of intestine and a wedge of mesentery containing enlarged lymph nodes were removed. The rest of the intestinal tract appeared normal. After this the patient made good progress for about one month. Then he slowly developed symptoms suggesting partial intestinal obstruction. Adhesions or contraction of the previous anastomosis were suspected, and a second laparotomy was performed about two months after the first. About 12 inches of the lower part of the ileum just above the ileocaecal valve were resected. This part contained two masses, which constricted the bowel. The remainder of the small and large bowel appeared normal. After this operation the patient improved and has been well for over 17 months. The pathological report of the removed tissue was "tuberculosis" with no evidence of malignant tumor.—*Hypertrophic Tuberculosis of the Ileum, J. M. T. Finney, Sr. and J. M. T. Finney, Jr., Amer. J. Surg., October, 1931, xlv, 149.*—(*J. P. B.*)

Signs of Tuberculous Enterocolitis.—The summary of 110 cases with tuberculous ulceration have been reviewed. Loose stools and pain were the most common symptoms. The objective signs were a cyclic temperature, tenderness on deep palpation over the diseased areas, a palpable mass usually in the right lower quadrant, and mild localized or generalized abdominal rigidity. For roentgenological examination the commonly accepted technique was used in this series. Ulceration in the small intestine is most difficult to diagnose. Persistent segmentation, with moderate dilatation at the distal end of these segmentation loops, is the most constant positive roentgenological finding. Irritability and filling defects in the ileocaecal region should be considered as tuberculous ulceration. Filling defects resulting from ulceration are persistent on hourly examinations. When these filling defects occur in the caecum or the ascending colon, they are of great significance; in the transverse colon they are of less significance; and in the descending colon and sigmoid of no significance at all unless corroborated by enema.—*Signs of Tuberculous Enterocolitis, H. H. Cherry, Am. J. Roentgenol. & Rad. Ther., January, 1932, xxvii, 65.*—(*W. I. W.*)

Tuberculosis of Rectum.—One hundred and fifty patients at the Chicago Municipal Tuberculosis Hospital were examined proctoscopically. They were classified clinically: (group 1) 65 patients without abdominal symptoms; (group 2) 65 patients with mild to moderate abdominal complaints; (group 3) 20 patients with marked abdominal symptoms and with advanced pulmonary disease. The results of the proctoscopic study were as follows: In group 1 no ulcers were seen through the proctoscope. In group 2, two patients (1.3 per cent) exhibited low-colon ulcers. In group 3, five patients (25 per cent) showed definite ulcerations. The majority of patients in both groups 1 and 2 were moderately advanced and group 3 consisted of far-advanced cases of pulmonary tuberculosis. The facts warrant the statement that, even in institutional patients, tuberculous ulcers of the rectum and sigmoid are uncommon except in patients with far-advanced disease. In 920 proctoscopic examinations of private patients, tuberculous ulcers were seen but twice. A normal chest roentgenogram or negative physical examination practically excludes tuberculosis as an aetiological factor in the causation of multiple ulcers in the rectum and sigmoid. The tuberculous lesion appears in the rectum in four forms: the ulcerative, the hyperplastic (fibrous), the miliary, and as an acute diffuse tuberculous enteritis. The ulcerative form is of the greatest clinical importance; the other forms are of infrequent occurrence. When multiple ulcers are seen through the proctoscope, parasitic dysentery or chronic ulcerative colitis are usually first to be considered as aetiological agents. In the past, tuberculosis has been of first consideration. As seen proctoscopically, tuberculous ulcers are uncommon in a patient who is able to be up and about. Even in a patient affected with active pulmonary tuberculosis and simultaneously a nontuberculous chronic ulcerative colitis (*colitis gravis*), the differential diagnosis should not be difficult, as the proctoscopic appearance of the bowel is quite different in the two diseases. In cases in which low-colon ulceration is due to tuberculosis, the usual proctoscopic appearance is fairly characteristic. The ulcers are moderately large; they vary from a few millimetres to several centimetres. Their outline is irregular and the edge is usually reddened, thickened and slightly raised, and often undermined a distance of a few millimetres. Commonly, the ulcer base is covered with a yellow pyogenic membrane which is only

slightly adherent and, on its being swabbed away, tuberculous granulation tissue is revealed. In chronic ulcerative colitis, two distinctly different proctoscopic pictures are seen. The first gross change ordinarily observed is a red, granular, pitted, easily bleeding mucosa; the surface is dotted with pinpoint to pinhead-size petechial ulcers or the scars of healed ulcers. The second characteristic picture of chronic ulcerative colitis seen proctoscopically is the addition of large irregular ulcers, from 4 or 5 mm. to several centimetres in diameter, to the mucosa already described. These "secondary" larger ulcers are frequently confused with those of tuberculous enteritis. However, study of the mucosa between the ulcers furnishes the important points of differentiation. Proctoscopically, amoebiasis with ulceration is less frequently confused with tuberculous colitis. A diagnosis of amoebiasis with ulceration can safely be made from the proctoscopic appearance alone when the ulcers are of the "button-hole" variety. These are elliptical or circular, and appear as small mounds which project 2 mm. or so above the mucosa; the tops of these mounds are gray or grayish-yellow, due to central necrosis, or are definitely ulcerated and excavated when the necrotic top sloughs. The "button-hole" amoebic ulcer is the type seen in the great majority of patients having amoebiasis with ulceration. In severe cases, larger flat ulcerations with the bases covered by a yellow, fairly adherent pyogenic membrane and detritus may also be present. The mucosa varies in appearance from the normal pink in the mild and chronic infections to a deep dusky red in the very acute types. If stricture occurs, it is a rare complication.—*Ulcers of the Rectum and Sigmoid: the Differentiation of Tuberculous Ulcers from Amebic Ulcers, and Chronic Ulcerative Colitis, C. L. Martin, J. Am. M. Ass., January 2, 1932, xcviii, 27.* —(*G. L. L.*)

Bone and Joint Tuberculosis.—Tuberculosis of bones and joints must necessarily be considered together. The spine, hip, knee and ankle are affected in the order named, while less frequently the elbow, shoulder, and wrist are the site of disease. Over 80 per cent of the cases are in children under 14 years of age. The chief characteristic pathologically is the long persistence of activity. Symptoms may develop after a case has been apparently quiescent for years. Early diagnosis is of the greatest importance, for the prognosis varies with the extent and duration of the disease. The roentgenogram is the greatest aid to diagnosis, and positive proof is obtained, when possible, by guinea-pig inoculation or by histological examination of diseased tissue removed at operation. Because of wide differences of opinion as to the relative value of heliotherapy and the various fusion operations in treatment, the authors have summarized carefully their conclusions after a study of 117 cases of tuberculous spine, 27 of tuberculosis of the hip, and 11 of tuberculosis of the knee, in the orthopaedic service of the Fitzsimons General Hospital. They conclude that heliotherapy has proved itself to be of the greatest value in the treatment of tuberculous spine and hip, but for some reason is ineffective in involvement of the knee-joint, and, in the latter cases, the Hibbs operation, or some modification using the patella as the graft, is favored as an adjunct. Bony ankylosis is the proper criterion of arrested disease in adults and probably in children. Fusion operations are valuable adjuncts in the treatment and should be employed in well-chosen cases of tuberculous spine and in all cases of tuberculosis of the knee. The results in tuberculous hips have been so pleasing that operative measures will be tried only in carefully chosen cases. The most frequent and fatal complication of tuberculous joints is sinus formation with secondary infection, and all treatment must be planned to avoid, if possible, the formation of sinuses. The death-rate falls to an almost negligible figure if sinuses are not present, and after they develop they become of more clinical importance than the original bony lesion.—*Tuberculosis of the Bones and Joints: Value of Heliotherapy and Surgery as Methods of Treatment, A. M. Lehman and D. C. Bartholomew, J. Am. M. Ass., April 16, 1932, xcviii, 1343.*—(*G. L. L.*)

Tuberculous Arthritis.—The term "tuberculous rheumatism" is vague and ill defined. For the purpose of the present discussion it is limited to the inflammatory systemic diseases of the joints, that is, the polyarticular forms of tuberculous arthritis. It may vary from ephemeral arthritic pain to destructive tuberculosis of the joint. It is questionable whether these arthritides are ever due to a toxic factor alone, since, with the improvement of bacteriological methods, the demonstration of organisms in the local lesion increases in frequency. A number of cases from the literature are quoted to show the great range of clinical variation that tuberculous disease of the joints may produce. It has been customary to state that tuberculous arthritis, unlike other infectious arthritis, does not respond to salicylates and does not produce endocarditic lesions. But it has been shown that some of the proved cases of tuberculous arthritis respond well to salicylates, and tuberculous endocarditis has been

demonstrated to exist. It is likely that rheumatism, in its arthritic and in its endocarditic form, is an allergic manifestation which may be produced by a variety of organisms, including the tubercle bacillus. This is the opinion which was first advocated by Weintraud in 1913. Erythema nodosum is probably another manifestation of the same mechanism. The recent findings of Loewenstein and Reitter might suggest that the majority of polyarthritides are due to the tubercle bacillus. The real significance of finding tubercle bacilli in the blood is still unknown, and it is totally unjustified at the present moment to assume that such findings settle the aetiology of a disease. This is all the more true since Loewenstein has obtained positive blood cultures in patients whose disease had nothing whatever to do with tuberculosis. In summary it may be said that, among cases of acute to chronic polyarthritis, there are some which are apparently due to the tubercle bacillus. The clinical picture of these cases is in no way different from those which have apparently another aetiology. The diagnosis must rest on the demonstration of a tuberculous lesion in some other organs and on specific focal reactions to small tuberculin injections. The finding of tubercle bacilli in the synovial fluid, as reported by Reitter, clinches the diagnosis; a positive blood culture does not. The treatment of choice is tuberculin therapy.—*Über tuberkulösen Rheumatismus, J. Bauer, Klin. Wchnschr., June 18, 1932, xi, 1071.*—(*M. P.*)

Acute Rheumatism and Tubercle-Bacillus Bacillaemia.—The thesis of this article is that acute rheumatism is an exudative phase in the course of a tuberculous reinfection. Out of 82 cases with acute polyarthritis, tubercle bacilli were found in the blood in 56 cases. It was further observed that all patients with acute rheumatism have a very high tuberculin allergy. The source of the bacillaemia is in most cases probably a lymph-node focus. During acute rheumatic attacks tubercle bacilli have been demonstrated microscopically in articular exudates which proves that they may leave the vascular bed. In the light of these findings, the Aschoff nodules which may be found anywhere in the connective tissue are interpreted as allergic tuberculous lesions. The pathogenetic significance of streptococci is entirely unproved by facts. It has been shown repeatedly that any acute allergic reaction may produce essentially the same tissue response regardless of the type of antigen. It is pointed out that acute rheumatism increases in frequency approximately parallel with that of tuberculous infection during infancy and childhood. Other foci of infection play a rôle in the pathogenesis of acute rheumatism in as far as they tend to increase the vascular permeability and to produce the conditions under which tubercle bacilli from the blood stream may focalize in the tissues.—*Ueber den pathogenetischen Zusammenhang des akuten Gelenksrheumatismus mit der Tuberkelbazillämie, C. Reitter and E. Löwenstein, Wien. klin. Wchnschr., March 4, 1932, xlv, 293.*—(*M. P.*)

Early Sign of Tuberculous Spondylitis.—The roentenogram in the early stages of spondylitis is unreliable. In examining a healthy patient with his back to the light there is seen an irregular groove from the neck to the sacrum. If the spine is affected the muscular bands diverge more or less, forming a rhomboid or oval-shaped depression. Palpation of the muscles encircling the depression (sacrolumbalis) shows them to be soft and doughy, and they do not contract. This is more evident in the prone position. The softening of the muscles around the depression is the specific sign of a tuberculous lesion of the spine.—*Early Sign of Tuberculous Spondylitis in the Pregibbus Stage, S. Kofman, J. Bone & Joint Surg., January, 1932, xiv, 143.*—(*J. F. B.*)

Fusion Operation for Tuberculosis of Elbow.—Fusion of the tuberculous elbow-joint may be accomplished by the use of a mass of cancellous bone, the olecranon process, with its soft tissue attachments intact, to bridge the joint from humerus to ulna. It is modeled after the method of hip fusion described by Hibbs.—*Fusion of the Elbow Joint for Tuberculosis, H. Hallock, J. Bone & Joint Surg., January, 1932, xiv, 145.*—(*J. F. B.*)

Tuberculosis of Knee.—Tuberculosis of the knee is frequently a very difficult disease to diagnose, for at times every one of the diagnostic maneuvers may fail. Formerly it was taught that white swelling of the joint (*tumor albus genus*) and hydrops of the joint were always tuberculous, but later opinion has it that these two conditions may have no relation to tuberculosis. Inoculation of arthritic-effusion fluid into guinea pigs is not as helpful diagnostically as many believe. A tuberculin reaction is of diagnostic help in children in the early years of life. Failure to react need not eliminate tuberculosis unless doses up to 10 mgm. are used. The focal reaction induced by tuberculin is not necessarily a specific reaction, because very similar responses may follow the injection of nonspecific substances, especially those containing proteins. There are numerous reports on nontuberculous arthritic

disease (*e.g.*, sarcoma) in which tuberculin set up a reaction. Likewise, the value of the X-ray in the diagnosis of orthopaedic tuberculosis has been overestimated. In tuberculosis evenly diffused calcium atrophy need not necessarily be present, and it is frequently present in numerous diseases which affect the synovia. In this disease sequestra and destructive processes may not show in the film. Osseous change is found at operation in many more instances than in the film. Even if the film reveals such foci regularly it tells but little of this nature—"whether they are tuberculous, syphilitic or oesteomyelitic—we cannot practice pathological anatomy with the Roentgen plate." As a rule, the sedimentation test is of little diagnostic help. A negative tuberculosis complement-fixation (Wasserman) reaction in fluid aspirated from a joint has but little value. But a strongly positive reaction, one stronger than that of the blood, is decisive. Exploratory arthrotomy should be performed much more often than it is, for a negative result from operation will save a good many patients from years of treatment for tuberculosis. Of 310 patients with disease of the knee joint, 131 were operated upon for either diagnostic or therapeutic purposes. Since diagnostic operation has been more extensively employed, the incidence of nontuberculous disease has been much higher among the patients in the Coast Hospital where all these observations have been made. Although exploratory arthrotomy is fully justified, it should be used as a last resort only, and only after all other diagnostic criteria have failed. Histological diagnosis upon tissue removed at operation is often very difficult. A certain small percentage of cases has to be diagnosed tuberculosis even though absolute evidence cannot be produced. A considerable number of patients have been treated over a long period for tuberculosis when in reality they had syphilis, arthritis deformans, tumor, etc., all of uncharacteristic appearance. *The Diagnosis and Frequency of Tuberculous Disease of the Knee, H. Sundt, J. Bone and Joint Surg., October, 1931, xiii, (o.s. xxix), 740.—(H. S. W.)*

Calcareous Tuberculous Kidney.—Spontaneous healing of renal tuberculosis is very rare. But changes may occur which resemble healing. Areas of the renal parenchyma undergo fibrous changes, the pelvis, calyces and parenchymatous cavities become filled with inspissated exudate and with the deposition of calcareous salts which may lead to the formation of the so called "cement" kidney. Whether the large areas of nodular tuberculosis in the kidney eventually develop into the same end-stage through calcification has never been ascertained. This stage of nodular tuberculosis may last for years without appreciable change. A three-year-old child developed tuberculosis of the left kidney, with the usual symptoms and signs of that disease. The child was in good condition otherwise, the physical findings, the weight, the temperature and the blood-picture all being normal. The renal disease progressed steadily until apparently complete destruction of the organ occurred. X-ray treatment was continued for one year but at the end of this time renal function on that side was zero.—*Die Mörtelniere (Endstadium einer kindlichen Nierentuberkulose), L. Schall, Deutsche med. Wchnschr., November 20, 1931, lvii, 1975.—(H. S. W.)*

Tuberculosis of Adrenals.—Although many cases of calcification of the suprarenal glands have been reported as the result of tuberculous lesions, data have not been presented to indicate the incidence of association of these two conditions. The authors studied the suprarenal glands in 34 cases which had been listed by the pathologists either as Addison's disease or as tuberculosis of the suprarenal glands. A positive clinical diagnosis of Addison's disease had been made in 23 of the cases, and a diagnosis of questionable Addison's disease was made in 3 other cases. In the remaining 8 cases there were tuberculous lesions of one type or another. The presence of calcification was determined by histological examination. A second group of suprarenal glands, which had been both grossly and histologically adjudged to be normal, was also observed. Both groups were then subjected to roentgenological examination. Calcification or areas of increased density were not shown in the normal glands. In the pathological glands there was wide variation in density, with obvious calcification in certain cases. The authors report 6 cases of Addison's disease with roentgenographic shadows in the region of the suprarenal glands. From a study of the available pathological material it appears probable that, in a considerable percentage of cases, calcification is present and that this can be roentgenologically demonstrated in life. Such a demonstration may be of diagnostic and prognostic significance, and it is urged that roentgenographic studies be made in cases of suspected or proved Addison's disease.—*Calcification in Tuberculosis of the Suprarenal Glands: Roentgenographic Study in Addison's Disease, R. G. Ball, C. H. Greene, J. D. Camp and L. G. Rowntree, J. Am. M. Ass., March 19, 1932, xcviii, 954.—(G. L. L.)*

Tuberculosis of Skin.—The skin may be infected by tubercle bacilli either from without or within. In the former case verrucous tuberculosis of the skin or lupus vulgaris results; in the latter case the result is one of the many other forms of skin tuberculosis. Exogenous tuberculosis of the skin may occur with or without a tuberculous infection elsewhere in the body, while a tuberculide always presupposes another tuberculous focus. It has not been settled yet whether tuberculides are due to toxins or to bacilli. The latter theory is increasing in probability. Beyond these hypotheses the following facts are definitely established: Tuberculides occur only in tuberculous patients. In a few early cases tubercle bacilli have been demonstrated in tuberculides. In a few isolated cases of large nodular tuberculides tubercle bacilli have been isolated in pure culture from the lesions. It has been possible in a few instances to produce in animals lesions which are clinically and microscopically very similar to tuberculides in human beings. The progression from tuberculides to genuine skin tuberculosis has been observed in a few cases. In the blood of patients with tuberculides, tubercle bacilli have been demonstrated in 75 per cent of the cases. All these facts make it very likely that tuberculides are caused by the haematogenous dissemination of tubercle bacilli. The histological picture of the tuberculides varies according to their age. Similarly the clinical picture varies from a simple erythema to an ulcerated node. The therapy of tuberculosis of the skin consists in the general treatment for tuberculosis. If possible, single foci should be excised. Other treatments which are recommended are tuberculin, arsenic, light and diet. The salt-free diet of Herrmannsdorfer changes the osmotic pressure in the skin and prevents thereby the new focalization of bacilli.—*Die Tuberkulose der Haut, O. Kren, Wien. klin. Wchnschr., April 29, 1932, xlv, 561.*—(*M. P.*)

Dietary Treatment of Lupus.—Many observers believe that the salt-free diet of Herrmannsdorfer and Sauerbruch has a favorable effect on lupus. The diet exerts its influence mainly through the vascular system, especially the capillary systems. It leads to an improvement in the circulation and equilibrates the exchange of fluids between tissues and vessels. Also it aids the patient by virtue of its increased vitamine content. It is known that pure solutions of sodium chloride exert a toxic effect upon animal cells and tissues. By the addition of other salts in certain ratios this toxic effect may be eliminated. In such physiologically equilibrated solutions sodium chloride, potassium chloride, calcium chloride and magnesium chloride are the chief ingredients. Physiological salt solution is damaging to living cells and tissues and has been replaced by Ringer's solution. The original Sauerbruch-Herrmannsdorfer diet combined with the "titrosalt" mixture was given to 33 cases of lupus for nine months. It led to the same (and very obvious) favorable results which are the rule in the original diet when given alone. Shrinking and paling of the lupus nodules initiated the healing process.—*Verwendung von Titrosalz bei der Diätbehandlung von Lupuskranken, S. Bommer, Deutsche med. Wchnschr., January 15, 1932, lviii, 91.*—(*H. S. W.*)

Tubercle Bacilli in Blood in Skin Tuberculosis.—Ninety-seven blood cultures for tubercle bacilli were done on 52 cases with tuberculous skin affections and with aetiologically uncertain diseases, and on 32 patients who served as controls. The bacteriological work was done in Loewenstein's laboratory, but the laboratory had no knowledge of the clinical diagnoses. All 32 control cases were negative. Of 52 patients, 22 gave a positive result, including 3 strains of avian tubercle bacilli. In addition to strictly tuberculous diseases, positive results were obtained in erythema nodosum, in a case of acne, in a case of lymphatic leukaemia, in a case of mycosis fungoides, and in one case of chronic eczema. A seasonal variation in the frequency of positive blood cultures, as suggested by Loewenstein, could not be definitely ascertained. It remains to be decided whether all acid-fast bacilli isolated from the blood-stream are true tubercle bacilli. In accordance with Loewenstein's previous publications the percentage of positive blood cultures is particularly high in lupus erythematodes.—*Ueber den Tuberkelbazillennachweis aus dem strömenden Blute (Methode Löwenstein) bei Hauterkrankungen, J. Konrad, Wien. klin. Wchnschr., April 1, 1932, xlv, 430.*—(*M. P.*)

Tubercle Bacilli in Blood in Skin Tuberculosis.—Loewenstein and his co-workers reported that tubercle bacilli could be isolated from the blood-stream in patients with skin tuberculosis in a high percentage. In lupus erythematodes they were found in 77.7 per cent, in *erythema induratum Bazin* in 70 per cent, in genuine skin tuberculosis in 75 per cent. These findings stimulated further work on this question. The bacteriological work was done strictly according to Loewenstein's methods. A total of 29 cases was examined and a positive result was obtained in one patient with lupus erythematodes. It

remains undecided why many authors have not been able to duplicate Loewenstein's results.—*Zur Frage der Züchtung von Tuberkelbazillen aus dem Blut bei tuberkulösen Hautkrankheiten, K. Schreiner, Wien. klin. Wchnschr., April 15, 1932, xlv, 488.*—(*M. P.*)

Tubercle Bacilli in Blood in Skin Tuberculosis.—Using Loewenstein's technique, blood cultures were taken on 353 patients with various skin lesions. The clinical diagnosis was not given to the investigators until the final reading on each culture had been made four to six weeks after being seeded. Two hundred and fifty-five cases were tuberculous in aetiology. Of these, positive blood cultures were obtained in 49 instances, or 15 per cent. Of the 90 control cases, clinically nontuberculous, tubercle bacilli were cultured from the blood in ten. Two of these 10 positive patients subsequently were found to have pulmonary tuberculosis. In the remaining 8 no tuberculous focus could be demonstrated. That a bacillaemia preceded the localization in an organ is offered as a possible explanation.—*Über Tuberkel-Bazillämie bei Hauttuberkulose, Kissmeyer and E. Loewenstein, München. med. Wchnschr., April 15, 1932, lxxix, 626.*—(*V. T.*)

Tubercle Bacilli in Blood in Skin Tuberculosis.—The examinations were done with Loewenstein's method, and all blood samples were cultured both in Loewenstein's laboratory and in the laboratory of Maresch. A total of 51 cases of skin tuberculosis and aetiologically uncertain skin diseases were studied. In Maresch's Institute, 7, and in Loewenstein's Institute, 13 positive cultures were obtained. They are distributed to patients with lupus erythematosus, erythema induratum Bazin, lupus vulgaris, tuberculides, verrucous tuberculosis of the skin and erythema multiforme. Some, but not all positive patients, had evidences of pulmonary tuberculosis. Four of the isolated strains were tested in guinea pigs, and found to be typical tubercle bacilli.—*Resultate mit der Löwensteinschen Blutkulturmethode bei verschiedenen Formen der Hauttuberkulose, A. F. Mathiesen, Wien. klin. Wchnschr., June 3, 1932, xlv, 719.*—(*M. P.*)

Isolation of Tubercle Bacilli from Skin.—In 20 cases of tuberculosis of the skin excised tissue was cultured for tubercle bacilli according to Loewenstein's method. Positive cultures were obtained in 3 cases of lupus vulgaris, in 2 of verrucous tuberculosis of the skin, in 1 of tuberculous ulcer and in 2 of scrofuloderma.—*Die Tuberkelbazillenkultur nach Löwenstein aus dem Gewebe tuberkulöser Hauterkrankungen, A. Matras, Wien. klin. Wchnschr., April 22, 1932, lxv, 524.*—(*M. P.*)

Experimental Tuberculous Dermatitis.—A characteristic dermatitis develops within six to eight hours in individuals with tuberculous infection when an oil emulsion of pulverized tubercle bacilli of human or bovine strains is rubbed on the skin, preferably on the undersurface of the forearm. The skin lesion consists usually of a papule with a central follicle, less often of a necrotic papule, or squamous dermatitis. Only rarely does a dry eczema appear. The papules are red, hot and slightly itching, and, when rubbed, excoriation occurs with formation of a haemorrhagic crust. The lesions persist for about three months, gradually decreasing in size. Their color turns from red to violet and ultimately fades, leaving a pigmented area. Microscopical examination of such lesions shows a follicular pustule with an accumulation of degenerated polymorphonuclear cells, infiltration of mononuclear cells mainly around the blood-vessels and papillae, but without eosinophiles or giant cells. Acid-fast bacilli were not found, either in the deep or in the superficial stratum of the skin. This so called follicular reaction may not be positive in tuberculous individuals in a cachectic state or in healthy persons with tuberculous infection, but with the tubercle bacilli held in check in tonsils, lymph nodes, skin and so forth.—*Dermite folliculaire tuberculeuse humaine experimentale, S. Marbais, Schweiz. med. Wchnschr., May 21, 1932, lxii, 499.*—(*V. T.*)

Tuberculous Encephalitis.—A negro child of four years was diagnosed at postmortem examination as "diffuse tuberculous encephalitis" because of the finding of 100 or more caseous lesions throughout the brain. There was also a more recent tuberculous meningitis. The occurrence of drowsiness, fever, loss of weight, and a change of disposition during the five months preceding the onset of the convulsion which led to the child's being hospitalized were inferred as having been due to the parenchymatous involvement of the brain rather than to the leptomeningitis.—*Multiple Tuberculous Lesions in the Brain of a Child (Tuberculous Encephalitis), A. E. Edwards and A. W. White, Am. J. Dis. Child., February, 1932, xliii, 396.*—(*M. D.*)

Tryptophan Test in Tuberculous Meningitis.—The application of the Furth and Nobel modification of the Voisinet test for tryptophan has been found positive in 90 per cent of cases of tuberculous menin-

gitis, a negative reaction generally ruling out this diagnosis (Aiello, 1927). In the series here reported the spinal fluid from all of 25 cases of tuberculous meningitis gave a positive reaction. A second group included 17 cases in which the nature of the spinal fluid or the clinical history or appearance suggested tuberculous meningitis and 36 cases of normal, xanthochromic, haemorrhagic, or purulent spinal fluids used as controls. A false positive but distinguishable reaction was obtained in the last three types of fluids. —*The Tryptophan Test in Tuberculous Meningitis, H. H. Lichtenberg, Am. J. Dis. Child., January, 1932, xliii, 32.*—(*M. D.*)

Climatic Treatment and Heliotherapy.—The modern conservative treatment of so called surgical tuberculosis (bone, joint, lymphatic, etc.) consists essentially of fresh-air-postural and solar-irradiation treatment. These procedures include Bier's hyperaemia treatment, injections of iodoform-oil, plaster-of-Paris casts and extension appliances. Experience has shown that the functional results obtained by these conservative methods are better than those brought about through surgical measures. There are exceptions, of course. Five hundred cases of surgical tuberculosis were treated by fresh-air exposure (St. Moritz), but the results were not as striking as they are when solar irradiation is added or is given exclusively. Of 1,000 cases of surgical tuberculosis given heliotherapy, 858 were healed, 120 improved, 18 unchanged and 74 died. The effect of heliotherapy is both general and local. General condition and weight improve surprisingly; febrile patients soon have normal temperatures. Pain is eased, and fistulae dry up following the spontaneous elimination of sequestra. The diseased joints again show normal contours and are functionally restored in large measure. The technique of solar irradiation is similar to that of Rollier and is well known. The local and general insolation must, however, be individualized. The fresh-air and solar therapy requires a long time, which may, in some cases, be abbreviated by surgical procedure. Suppurating lymph nodes are opened and curetted, loose bone sequestra are removed, fistulae are cauterized. Cold abscesses, especially descending abscesses, are aspirated or opened and immediately sutured. Mixed infection or the formation of fistulae in tuberculous spondylitis does not occur in treatment by solar irradiation alone. Resorts to surgical measures, such as the Albee operation, is unwarranted. As to tuberculous joints, in a few cases radical resection of the shoulder-joint and knee-joint may be necessary. In older patients with tuberculosis of the foot a low amputation of the leg is done. A tuberculous testicle is also removed, as is a tuberculous kidney, even in bilateral involvement. This results in improvement of the tuberculous cystitis. Heliotherapy is further assisted by orthopaedic measures, extension appliances, plaster-of-Paris casts and massage of the muscles.—*Über klimatische und Sonnenlichtbehandlung der chirurgischen Tuberkulose, O. Bernhard, Deutsche med. Wchnschr., February 5, 1932, lviii, 203.* —(*H. S. W.*)

Effect of Treatment on Positive Sputum.—A comparative study of the results of the various methods of treatment used at Vejlefjord Sanatorium, during a period of thirty years, with special reference to the disappearance of tubercle bacilli from the sputum before the patient has been discharged from the sanatorium, has been made. During this period, 3,119 patients with tubercle bacilli in the sputum were treated. Of these, 980 patients were discharged with negative sputum. It is not claimed that the mere disappearance of bacilli from the sputum always indicates that a patient has been cured of tuberculosis. But it does give, in a rough manner, enough evidence to assess the value of the different methods used in the treatment of pulmonary tuberculosis. The patients were classified, according to the severity of the lesion, into three stages. It was concluded that sanatorium treatment alone, without additional methods, can as a rule be considered sufficient for pulmonary tuberculosis in stages I and II. However, in stage III, additional methods of treatment are usually necessary. Artificial pneumothorax, cauterization of adhesions, thoracoplasty, phrenic evulsion and sanocrysin are methods, which, if combined with sanatorium treatment, give over 100 per cent better results than those obtained by sanatorium treatment alone.—*The Value of Various Methods of Treatment with Regard to the Disappearance of the Tubercle Bacillus from the Sputum, P. V. Benjamin, Tubercle, January, 1932, xiii, 145.*—(*M. E. P.*)

Curative Effects of High Altitudes.—High altitude *per se* does not effect tuberculosis cures. Individuals who spend their lives in mountainous districts develop tuberculosis under conditions analogous to those leading to tuberculous disease in the lowlands. Furthermore, mountain people who become infected with tubercle bacilli do less well at the higher elevations than do the lowlanders transported to the mountains. The essential factor is the change of climatic conditions, resulting in a general stimulus leading to constitutional improvement.

Thus, native-born mountaineers developing tuberculosis do better when removed to the lowlands. Too long a stay of lowlanders in the mountains, or mountaineers in the lowlands, mitigates against the climatic benefit in that each becomes acclimated. A reversal of climatic environment should then be initiated.—*Tieflandkuren für Tuberkulosekranke aus dem Hochgebirge, R. Campell, Schweiz. med. Wchnschr., May 14, 1932, lxii, 472.*—(*V. T.*)

Climatic Treatment in German Mountains.—The advantages of the climate of the higher mountains for generalized pulmonary tuberculosis are well known. Heliotherapy in orthopaedic tuberculosis originated in the resorts in Switzerland. But since Brehmer's time it has been known that in the moderately high mountains and in the lowlands good therapeutic results may be obtained. Irritable constitutions are not suitable for treatment at very high altitudes (over 1,000 metres). For most cases of pulmonary tuberculosis a cure in a moderately high altitude is the safest. For certain cases of pulmonary tuberculosis, such as those complicated by disturbances of the nervous or vascular system, and in early infiltrations, a high altitude is very often contraindicated. Unfavorable irritative symptoms in the lowlands during the winter are fluctuating temperatures, fog, humidity and scarcity of ultraviolet rays. Fluctuations of temperature in the highlands (as Davos, Arosa) are smaller. The air in the mountain peaks and valleys in the winter is purer, and is dust and germ-free and free from chemical impurities. The number of clear days during the winter in Oberstdorf and St. Blasien is as great as in the Harz and in Thüringen. This holds good only for the mountain valleys, as the region of the peaks is rather cloudy. Ultraviolet radiation during the winter in the lowlands is very limited, whereas in the moderately high mountains it is very suitable for therapeutic use. In the higher mountains sunlight radiation is so intense that it can be used only with certain precautions.—*Winterkuren im deutschen Mittelgebirge, A. Bacmeister and H. Lossnitzer, Deutsche med. Wchnschr., January 1, 1932, lviii, 3.*—(*H. S. W.*)

Sun Treatment Causing Bronchitis.—Sunlight produces an acute inflammation of the mucous membranes of the upper respiratory tract in numerous children of exudative-lymphatic diathesis. The fair type with blond hair and soft transparent skin predominates, although dark-haired children with gray eyes and delicate skin may be susceptible. The skin of these children does not pigment on exposure to the sun, but responds to sunlight with an inflammatory reaction, varying in intensity from erythema to outspoken burns. Coincidently, the mucous membranes of the upper respiratory tract may show an inflammatory reaction leading to the clinical picture of an acute bronchitis. This bronchial reaction may be due to the presence of irritating products released by the disintegration of protein under the influence of ultraviolet rays. Other symptoms of sun-reaction, such as headache, nausea, and fever, may also be attributed to the effect of degenerated protein bodies.—*Die Sonnenbronchitis, K. Klare, München. Med. Wchnschr., May 13, 1932, lxxix, 795.*—(*V. T.*)

Light Therapy.—There is a lack of agreement between the practical and therapeutic results of irradiation and the scientific and experimental observations. Experiments have been carried out for the most part on healthy men and animals, whereas usually the practical results have been obtained on the sick. The abnormal organism is much more sensitive. Many claims made for the use of radiation are still based on empirical results, and practical applications have been made without scientific support, chiefly because the action of radiation on the living cell is not clearly understood and the fundamental principles of the biophysics and physiology of radiant energy are still unsolved. So it is evident that much confusion still exists. *Physical Properties of Light:* The ultraviolet rays of sunlight extend from about 390 to 290 millimicra, and those of clinically used artificial sources from about 390 to below 200 millimicra. The ultraviolet rays of a source such as the plain carbon-arc of 20 amperes, which has been so frequently used clinically, extend to about 220 millimicra, while those of the quartz-mercury-vapor-arc terminate at 185 millimicra. Crystalline quartz in 1 cm. thickness transmits about 80 per cent of ultraviolet rays at 200 millimicra. Most window glasses which are made especially for transmitting short wave-length ultraviolet radiation season for the first few weeks of usage. When this point is reached, the transmissibility is fixed and permanent, and they still transmit an effective quantity and quality of ultraviolet light for antirachitic effect. The ultraviolet rays between 320 and 290 millimicra are probably the best pigment-producing rays. *Biological Effects:* Red and infrared rays, if of sufficient intensity, produce an immediate hyperaemia which soon disappears after the cessation of the irradiation. Infrared rays longer than 1.4 micra are more likely to produce cutaneous blisters in animals; those shorter than 1.4 micra pene-

trate the skin. The infrared and visible rays produce, through heating, a dilatation of superficial capillaries and an increased blood-flow and exudation of lymph. Irritation of the skin gives rise to three responses; namely, local vasodilation, a wheal, and, finally, under severe action, a local oedema and blistering. This triple response is provoked directly by a substance similar to, if not identical with, histamine. Blister production that results from great increase of permeability may serve a protective function, since the fluid absorbs greatly in the region of 280 millimicra. Ultraviolet rays are rapidly absorbed, in most part, by tissues of a depth of less than 1 mm., and produce marked chemical changes. There is greater variation in percentage penetration of ultraviolet than in other parts of the spectrum. At 280 millimicra the absorption in the corneal and prickle-cell layers is marked so that the great antirachitic effect of this wave-length must occur in or about these layers; but on both sides of this band, around 300 millimicra and 250 millimicra, the penetration is greater, more radiation reaching the malpighian layer and corium. From 250 millimicra down, the absorption in the corneal layer increases rapidly and at 200 millimicra the absorption is so complete as to prevent any radiation from reaching the living layers of the skin. Haemoglobin absorbs ultraviolet rays as well as many of those of longer wave-lengths up to approximately 450 millimicra. Blood-serum absorbs the ultraviolet rays, possibly chiefly because of its tyrosine and tryptophan content. The conclusion that the shorter the wave-length of ultraviolet the greater the bactericidal action is in error, as it has been shown that there is a characteristic curve of bactericidal effectiveness for different bacteria, where the striking maximum is between 260 and 270 millimicra. Cholesterol, a substance found in comparatively large quantities in the skin, is activated chemically by ultraviolet irradiation. This has been shown by isolating cholesterol and rendering it antirachitic by irradiation with ultraviolet rays. The substance which is made antirachitic appears to be ergosterol, or an allied substance which is found in ordinary cholesterol, as an impurity. Many food products, such as fats, oils, milk, vegetables and lettuce, may also become endowed with antirachitic power through exposure to sources of ultraviolet energy. *Physiological Effects:* The increase in calcium and phosphorus content of the blood-serum in rickets and tetany under ultraviolet radiation is due in all probability to an increased absorption of calcium from the intestine. Under solar radiation, the blood shows increased alkalinity, a fact attributed more to the action of the heat rays. Reticulocytes vary in number with the season, being highest in the spring and lowest in the winter. This seasonal variation seems to be in direct proportion to the amount of sunshine. There may be a relation between the cure and the prevention of anaemia, and sunlight or ultraviolet. Basal metabolism is increased only slightly, if at all, by light exposures alone, but it can be markedly increased by exposure to moving air. Acne vulgaris is less common in tanned skin than in untanned skin. Erythema of the skin, produced either by heat or by actinic radiations, is accompanied by transitory increased bacteriophagic and bacteriolytic power of the blood-serum and leucocytes for streptococci, pneumococci and staphylococci. It is doubtful whether systemic effects resulting from local skin irradiation are due to reflexes arising from stimulation of nerve end-organs. It is still debatable whether changes are produced in the blood directly by penetrating rays. It seems possible that hormones are produced in the skin, because a systemic effect, like the antirachitic, results from irradiation with rays of which only approximately, 10 per cent penetrate to the blood-vessels. Heat rays and heat effects of luminous rays have been shown to increase and hasten the effect of ultraviolet energy, but experiments have also shown that red rays may act antagonistically to ultraviolet. With lamps, moving air from outdoors should be employed, if possible. Air movement produces increased heat radiation and conduction with better respiration and excretory function of the skin. Cool moving air acts directly on the vasomotor system, stimulating the superficial capillaries, producing a hyperaemia and, in turn, a depletion of the cutaneous circulation. *Pigment:* Mercury-vapor-arcs produce a yellowish-brown pigmentation. The pigment from sunlight, the carbon-arc and tungsten-arc is blackish-brown or red-brown. That increased pigment production necessarily means an increased tendency to healing is not generally accepted. Patients who failed to develop pigment have responded favorably to treatment, just as patients who developed a strong pigment often failed to heal. Primary melanin deposit is in the basal cells of the malpighian layer; and the greatest absorption in this layer, according to Bachem and Reed, occurs at 300 and at 250 millimicra. Pigment undoubtedly is in some way correlated with increased tolerance to irradiation. It not only absorbs but radiates energy. *Dosage:* Curative results in light therapy may be brought about without the production of marked cutaneous burn, and even the first degree of redness need not be produced. In treatment of rickets, expo-

sures with the quartz-mercury-arc as small as five minutes anteriorly and posteriorly twice weekly have proved curative. A practical method in the treatment of disease is to aim at a faint erythema production with each dose applied. Thus, skin sensitiveness is maintained. Overheating of the body is avoided by using short and intense exposures. The degree of skin erythema may guide in regulating dosage. The skin is rested during desquamation and several days elapse before further exposure to this area. When the skin becomes insensitive, say, to large doses of mercury-vapor-quartz light, an exposure to long-flame carbon-arcs is employed. Over dosage of light may produce injury. Excessive exposure has caused a drop in the bactericidal power of the blood with malaise and fatigue. Very aged patients have been considered to have their resistance to infection lowered by the injudicious application of light. In tuberculosis, overdosage has produced focal reactions that have done harm; light may set up a focal reaction similar to that of tuberculin. In some cutaneous disorders (eczema, psoriasis, lupus erythematosus, herpes simplex, erythema solare perstans, xeroderma pigmentosum, freckles, atrophy, keratoses, prematurely senile skin) exposure may cause an exacerbation, provoke an attack, or produce other injurious effects. It is highly probable that, in most forms of progressive acute tuberculosis, light therapy is not indicated. In the author's experience, intestinal tuberculosis is an exception. In this complication at times, even when progressively active, mercury-vapor-quartz light has seemingly been of great value. With bone-and-joint tuberculosis, orthopaedic treatment with immobilization and traction is absolutely essential while light exposure is being employed. Surgical intervention is occasionally needed, especially for the aspiration of abscesses or for hastening the expulsion of sequestra. *Clinical Results:* Clinically, ultraviolet is most effective in rickets, tetany and osteomalacia. The empirical results are strongly impressive when light is used as an aid in certain skin diseases, superficial ulcerations and many forms of extrapulmonary tuberculosis. It must be left to the future to substantiate and disprove reported favorable clinical results in conditions such as secondary and pernicious anaemias, nasal sinusitis, hay-fever, common colds, catarrh, asthma or carbon-monoxide poisoning, and many skin diseases. Light has repeatedly been quoted as an important tonic agent and one that will raise resistance against most systemic infections, without proof of action. In skin diseases, ultraviolet has proved of great value when used locally and generally in the treatment of lupus vulgaris and scrofuloderma. It has occasionally been found useful in acne vulgaris, psoriasis, indolent ulcers, pityriasis rosea, adenoma sebaceum (in blistering doses) and erythema induratum. In tuberculosis, light of any form by itself is not curative but comprises only one of the important adjuvants in treatment. If one employs light as an aid only, the most favorable response to solar exposures has been shown in the so called pretuberculosis of children, and tuberculosis of the lymph nodes (including hilum), pleura, bones and joints, peritoneum and intestine. Less favorable results are obtained in genitourinary, laryngeal, ocular, aural and cutaneous tuberculosis. Pulmonary tuberculosis is not an indication for light therapy. In joint tuberculosis it is claimed that the fibrous form of ankylosis has been overcome and joint function has been restored, but how permanent these favorable results will prove to be cannot be stated. Orthopaedic measures still play the major rôle in bone-and-joint tuberculosis; and intervention by surgical fusion should always be considered in cases of advanced bony destruction. With plain or cored carbon-arcs of high amperage (from 55 to 75 amperes) or with arcs of lower amperage (from 20 to 29 amperes), the best results have been reported with cutaneous and ocular tuberculosis and that of the bones and joints, lymph nodes, larynx, peritoneum and intestines; less favorable have been the reports on pulmonary and genitourinary tuberculosis. In the author's experience with the use of quartz-mercury-vapor light, the most favorable response has been encountered in intestinal tuberculosis. The author is convinced that this result is directly related to the light therapy and occurs frequently if the disease is not of the acute progressive type and if the patient's condition is not too poor. Other forms of tuberculosis which are frequently helped by mercury-arc light exposures are the "hilum glandular," or so called hidden tuberculosis of children and adults, and the superficial forms of tuberculosis, such as the cutaneous, oral or pharyngeal, laryngeal (except the acute and oedematous forms), corneal and phlyctaenular ocular tuberculosis, and the lymph-node and peritoneal tuberculosis. Less favorable in their response are genitourinary, and bone-and-joint tuberculosis. Postoperative sinuses after nephrectomy are especially responsive.—*The Present Status of Light Therapy: Scientific and Practical Aspects, E. Mayer, J. Am. M. Ass., January 16, 1932, xcviii, 221.*—(*G. L. L.*)

Dietary Treatment of Tuberculosis.—In recent years, experimental and clinical attempts have been made for the direct pur-

pose of altering the organism's blood and tissue reactions by means of food. The difficulties involved in any such experiment are easily understood when one recalls how tenaciously the organism retains its blood and tissue reactions, and how stubbornly the regulatory mechanisms of the body prevent displacement of the acid-base equilibrium to one side or the other. In the face of existing uncertainities and differences of opinion, it is clear that any conclusion about a diet for tuberculosis patients must rest on large clinical experiments properly controlled over a considerable period of time. From such experiments and subsequent theoretical interpretations, a diet has recently been promulgated by Gerson, Sauerbruch and Herrmannsdorfer. The essentials of this diet are (1) the all but complete exclusion of sodium chloride, with a sodium-poor but calcium rich salt compound being used as a substitute; (2a) a large percentage of uncooked fresh vegetables in the diet, either in the form of vegetable extracts prepared by pressing uncooked vegetables, such as carrots, beets, spinach and turnips, or in the form of salads with added fruit juices similarly prepared; (2b) preparation of cooked vegetables in their own juices in waterless cookers; (3) marked restriction of meats; (4) restricted water intake, but fairly liberal amounts of freshly expressed juices of fruits and vegetables; (5) various spices to increase the flavor of the dishes; (6) a mineral compound chiefly of calcium lactate and calcium phosphate, with calcium and magnesium combinations in the form of double salts; strontium, aluminum and silica in colloidal albumin combination, and a codliver oil, each of these given three times a day; (7) rich fat and protein, but low carbohydrate foods. Despite the variations in the reported results of separate trials with this diet, many of its most violent opponents have admitted that this therapy is an advance. The author's experiences very largely agree with the evaluation of it made by the Hamburg Medical Congress, that the diet is a distinct therapeutic advance as an aid generally effective in the treatment of lupus vulgaris, and occasionally in bone and joint tuberculosis, but that its value in other forms, more particularly pulmonary tuberculosis, is yet to be determined. Symptomatic improvements, even in pulmonary tuberculosis, have been common, but the effective factor cannot be evaluated. However, the diet seems directly responsible for many relieved cases of functional disturbances attendant on pulmonary tuberculosis, especially with chronic constipation or gastric hyperacidity. Tuberculosis, with the rare toxic nephroses or essential hypertonia or vasoneuroses, is occasionally helped by it. The leading authorities report favorable effects from this diet in the treatment of lupus vulgaris: retrogression of swelling, flattening of the foci, and absorption and disappearance of the individual nodules. Lupus of the mucous membranes reacts even better than lupus of the skin. Foci of the nasal mucosa, the hard palate, the pharynx and the larynx have been benefited; the lupus foci about the gums of the teeth have been most resistant. Noteworthy influence on exudative processes is clearly shown; the dry squamous forms react less favorably. The best results are seen when light treatment by general exposure in minimal doses is added. The author's conclusions are arrived at from the observation of 16 lupus cases. In an occasional sinus in genitourinary and in bone-and-joint tuberculosis that has come under his observation, the diet has helped to bring about favorable closure where other therapeutic procedures had failed for from one to two years. Any schematization of the dietary therapy for all constitutions must be rejected. A universally efficacious curative treatment for tuberculosis does not exist. However, the resistance of inferior constitutions and of defective or deficient organic functions can be raised by correct dietary treatment, and the raising of this resistance represents the meritorious aspect of these new endeavors.—*Salt-Restricted Dietary: With Particular Application to Tuberculosis Therapy, E. Mayer, J. Am. M. Ass., December 26, 1931, xcvii, 1935.*—(*G. L. L.*)

Dietary Treatment of Pulmonary Tuberculosis and Migraine.—It was frequently observed that active tuberculosis in patients with migraine stopped the migraine attacks. If, however, the tuberculous process is well healed under the influence of the Gerson diet, migraine attacks frequently recur. This is particularly surprising since the same dietary regimen frequently cures migraine. Similar relations are sometimes observed between asthma and tuberculosis. The rest of the article reiterates previous directions in regard to the dietary regimen and its results in various clinical forms of tuberculosis.—*Diäbehandlung bei Migräne und Lungentuberkulose, M. Gerson, Wien. klin. Wchnschr., June 10, 1932, xlv, 744.*—(*M. P.*)

Gerson Diet.—The modification of the Gerson diet, as advocated by Sauerbruch and Herrmannsdorfer, deviates very much in important points from the original formula. In the modification the protein intake is more than doubled, and the overabundance of vitamine-rich food is decreased. The essential similarity of the two regimens is the ex-

tremely reduced intake of sodium chloride. This factor is undoubtedly the therapeutically active principle. Gerson emphasizes the importance of protein hypersensitiveness, but it is likely that the tolerance to protein which he observes in his patients is artificially produced by the low protein intake. The therapeutic action of Gerson's diet is uncertain in pulmonary tuberculosis.—*Bemerkungen zur Gerson-Diät, C. Noorden, Wien. klin. Wchnschr., June 3, 1932, xlv, 708.*—(*M. P.*)

Gerson Diet.—This article is written to refute the statements of deRaadt that the Gerson diet increases the formation of phenol in the intestinal tract, and that the favorable results which are obtained in skin tuberculosis with this diet are due to this autophenolization. It is stated that a diet poor in sodium chloride does not decrease the secretion of hydrochloric acid and consequently does not increase the formation of phenols. In fact, it was demonstrated in 22 out of 24 patients that there was no increase in phenol in the urine, although these patients had been on the diet for a considerable length of time and had shown marked improvement.—*Zur Wirkungsweise der S. H. G.-Diät, Kritik der Ausführungen de Raadts, Edith Korvin, Wien. klin. Wchnschr., January 29, 1932, xlv, 144.*—(*M. P.*)

Gerson Diet.—In answer to Korvin's preceding article it is reiterated that both experimental and clinical observations have shown that a decrease of sodium chloride in the diet diminishes the hydrochloric-acid secretion and that consequently a marked increase of phenol occurs in the intestinal canal. Starvation has the same effect and influences the healing of lupus in the same way as Gerson diet. One patient with lupus was treated with phenol (300 mgm. per day) and within 4 months he showed better healing of his lupus than patients on Gerson diet.—*Zur Wirkungsweise der S. H. G.-Diät, O. L. E. de Raadt, Wien. klin. Wchnschr., January 29, 1932, xlv, 146.*—(*M. P.*)

Gold Treatment of Tuberculosis.—A total of 57 cases of pulmonary tuberculosis was treated with a gold preparation called Lopion. This particular preparation is approximately one-fifth as toxic for normal rabbits as sanocrysin. The clinical results were as a whole satisfactory, but not startling. The treatment is indicated in patients who have elevations of temperature and other toxic symptoms over long periods of time and who do not seem to have much of a spontaneous healing tendency. This treatment should never be used instead of collapse therapy, but it may be used simultaneously with collapse therapy. Lopion is contra-indicated in the presence of renal or hepatic damage, of intestinal tuberculosis and when there is a tendency to haemorrhage. In some patients rather severe reactions are observed and may necessitate the termination of the treatment.—*Ueber Goldbehandlung der Tuberkulose mit Lopion, E. Waltuch and O. Weiss, Wien. klin. Wchnschr., March 25, 1932, xlv, 394.*—(*M. P.*)

Sanocrysin.—One hundred and four patients with pulmonary tuberculosis were treated with sanocrysin. From a detailed study of these patients, it was concluded that sanocrysin has some favorable effects on a large percentage of adults, provided the general condition of the patient is not too unfavorable. It has deleterious effects in extensive disease when the general condition of the patient is unsatisfactory. The exudative type responds best to the drug and the infiltrative type is favorably influenced. In most patients with these types the improvement is well maintained. The chronic fibroid type shows only temporary improvement. The fibrocaseous type is not materially benefited. Sanocrysin is of great value as an adjunct to artificial-pneumothorax, particularly when there is disease in the contralateral lung, on which the drug has a most favorable influence. In these cases it should be given as soon as the collapse is well established. The drug is useless in the presence of an uncollapsed cavity, even if artificial pneumothorax has been successfully induced. The value of a second course of sanocrysin when the first has benefited has been clearly shown, but there should be an interval of two or three months between the two courses. The remote result will generally be unsatisfactory if the drug fails to render the sputum negative. With careful regulation of dosage, based on the detailed observation of the effects of sanocrysin on each patient, all serious complications can be avoided. Contramine in glucose has been used with success for the skin eruptions occurring during the treatment.—*A Study of the Results of Sanocrysin Therapy in Pulmonary Tuberculosis, G. S. Smith, Tubercle, January, 1932, xiii, 152.*—(*M. E. P.*)

Method of Diluting Tuberculin.—A simple method of making any desired dilution of tuberculin is described. One-tenth cubic centimetre of tuberculin is added to 10 cc. of sterile physiological salt solution. One cubic centimetre of this solution equals 0.01 cc. of tuberculin. One-half cubic centimetre of this solution is then mixed with 45 cc. of salt solution. One cubic centimetre of the resulting solution equals 0.001 cc. of

tuberculin. Varying dilutions can be made from these two stock solutions which should be freshly prepared daily.—*A Simple Method of Diluting Tuberculin, J. W. Tomb, Tubercle, April, 1932, xiii, 299.*—(*M. E. P.*)

Spahlinger Treatment of Tuberculosis.—Spahlinger's method of preparation of antigens for preventive immunization of cattle and human beings against tuberculosis is described. Tubercle bacilli from infected subjects, either cattle or human beings, are cultivated on specific culture media. An emulsion is then made of these bacilli in either distilled water or normal saline solution, and kept in ampules until all the organisms have died. It is then stated to be a harmless, though effective material for preventive immunization.—*Spahlinger Treatment of Tuberculosis, Disclosure of Formula, Brit. M. J., February 6, 1932, no. 3709, 252.*—(*M. E. P.*)

Collapse Therapy.—There is much dissension concerning the use of the various methods of pulmonary collapse in the treatment of tuberculosis. Roentgenology is the most reliable method for examination in pulmonary tuberculosis and for the control of treatment, especially of collapse therapy. In infants one usually finds hilar or parahilar opacities. Early, the shadow may extend very little beyond the hypertrophied tracheobronchial lymph nodes. In more advanced cases, parenchymal infiltration extends toward the periphery, while regression is from the periphery toward the hilum. An initial lesion, usually at the base of the lung and with adenopathy, may be noted first, while a homogeneous infiltration may begin later at the hilum. Pleural exudate frequently appears simultaneously with the parahilar opacity. Evidently the early lymphatic involvement and basilar initial lesions comprise the first stage; the hilar and further infiltration, the second stage, variously termed epituberculosis, paratuberculosis, and benign tuberculous infiltration. In this latter stage, the one usually found in infants, there is hypersensitiveness and generalized tuberculous infection. Therefore, some form of collapse should be induced. Spontaneous regression of the lesions will take place within a few months. In the adult one finds the tertiary stage, with relative immunity and localized infection. Whether the adult's tuberculosis is of endogenous or exogenous origin is disputed. The following facts indicate that it is endogenous, due to activation of an old infection: Primary lesions are usually located at the base of the lung where respiration is greatest, while in the adult one finds the clavicular region involved most often. Conjugal infection is rare. Clinical appearance of tuberculosis is frequent in the Swiss army, or within a short period following the two to eight weeks' period of military service. Since thorough examination is made on entrance and since practically no cases of so called open tuberculosis are in the army, the extreme physical effort of service must cause activation of latent infections. Since infection is localized in the adult, treatment by collapse is efficacious in selected cases. After much experience, the conclusion is drawn that phrenicectomy is preferable to artificial pneumothorax. With the latter, adhesions frequently prevent collapse, serofibrinous or purulent exudates often appear, while pleuropulmonary perforations and air emboli may be produced. Usually pneumothorax is continued beyond the period of time sufficient for obtaining all the benefit possible. Aggravation of lesions on the opposite side is found more often than after phrenicectomy. In the past, pneumothorax has proved more efficacious bacteriologically. This is explained by the fact that phrenicectomy was used only in old lesions, and after failure of pneumothorax and often of oleothorax also. Nevertheless, a review of cases treated shows success in a greater percentage after phrenicectomy than after pneumothorax. Phrenicectomy is less unphysiological. One operation is sufficient and often procures healing of a cavity in a few months when pneumothorax has failed. In thoracoplasty, the third method of collapse, 11 ribs are usually resected regardless of the size of the lesions. But partial thoracoplasty, with resection of the ribs at the level of the lesions, is as efficacious as massive collapse and less mutilating. It conserves function in a portion of the lung, thereby permitting a similar operation on the opposite side if necessary. Most surgeons prefer to begin resection at least as low as the seventh rib in order to provide a large operating field. But as few ribs as desired may be resected if one begins posteriorly. Some clinicians advocate collapse of the entire hemithorax in order to prevent postoperative bronchial emboli. But 55 per cent are aspirated into the opposite lung, only 11 per cent into the diseased side, and the remaining into both, while massive collapse prevents aspiration into the collapsed side only.—*La collapsothérapie chez l'adulte et chez l'enfant, J. Morin, Arch. Médico-Chirurg. d. l'Appar. Resp., 1931, vi, 229.*—(*E. K.*)

Collapse Therapy.—After a general discussion of the various methods of collapse therapy, the final results of the different pro-

cedures are presented. The results are based on a negative sputum. According to this criterion, the satisfactory results of unilateral pneumothorax have increased in the author's hands from 18 per cent in 1918–1921 to 47 per cent in 1926–1928. The improvement of results is partly due to better indications, but probably more so to the more frequent use of auxiliary operations such as intrapleural pneumolysis and phrenicectomy. Of 72 patients who were treated with bilateral pneumothorax 36 per cent were rendered bacilli-free, while phrenicectomy as an independent operation produced the same result in 18 per cent. Following thoracoplasty and tamponing 38.5 per cent of the patients lost their bacilli. Of all patients who showed good results 2 to 5 years after the treatment 61 per cent did not have any exacerbations after 9 to 12 years. On this basis it may be expected that permanent results (10 years) will be approximately as follows: 28 per cent in unilateral pneumothorax, 22 per cent in bilateral pneumothorax, 23 per cent in thoracoplasty and tamponing, and 12 per cent in phrenicectomy. But these results can be greatly improved if collapse therapy can be started earlier in the disease in a larger number of patients. Permanent results were obtained with pneumothorax treatment in 50 per cent of those patients who had a positive sputum for only 1 to 3 months before treatment, while this percentage dropped to 16 per cent in patients who had open tuberculosis for more than 2 years preceding the treatment. The final results are better in patients below 35 years of age than in older ones. Another important factor is the duration of the pneumothorax treatment. In patients treated for more than 2 years, permanent results were obtained in 68 per cent, while in those treated 6 months or less, only 9 per cent permanent results were obtained. In comparing the various methods of collapse it is important to point out that the relation between the results at the time of discharge and those some years later (permanent results) is least satisfactory in pneumothorax with phrenicectomy and most satisfactory in independent phrenicectomy and in thoracoplasty. In other words, better permanent results are obtained with those methods which produce a permanent collapse. The following conclusions are reached: Collapse treatment produced permanent cure in about 25 per cent of patients with open pulmonary tuberculosis. About 20 per cent are restored to complete economic normality. The results of collapse therapy will be improved by earlier diagnosis, by earlier operation and by more prolonged treatment.—*Sinn und Aussichten der Kollapsbehandlung bei Lungentuberkulose, H. Ulrici, Klin. Wchnschr., April 9, 1932, xi, 643.*—(*M. P.*)

Surgical Treatment of Pulmonary Tuberculosis.—The inherent tendency toward healing in pulmonary tuberculosis is enhanced by rest. The procedures employed by the tuberculosis surgeon for obtaining rest or removal of diseased parts are (1) interruption of phrenic innervation, (2) artificial pneumothorax, (3) thoracoplasty, (4) apical extrapleural compression, (5) direct drainage, (6) myoplastic plugging and (7) pneumonectomy. Satistics, their value and limitations in surgery of the phthisical, are discussed. Contraindications for surgical procedures in tuberculous patients are as follows: (1) the contralateral lung is badly destroyed, (2) the other essential organs of the body are broken down beyond repair, (3) progressive cerebral lesions, (4) advancing cardiovascular disease, (5) progressive nephritis and (6) inoperable neoplasms. Ten cases are presented all of which would probably have died but for surgical intervention. Three patients died; the remainder were given a new lease on life.—*Operative Treatment of Phthisis, H. Lilienthal, Amer. J. Surg., October, 1931, xlv, 356.*—(*J. P. B.*)

Selective Artificial Pneumothorax.—A successful selective pneumothorax depends upon observance of the following rules: Anatomically, the lesion must be recent in origin, of an easily compressible ulcerocaseous type with little fibrous tissue, well localized, and there must be no other active lesions in the lung. Technically, the needle must be inserted over the lesion and the air not forced, but allowed to enter slowly; negative pressure must be retained. Parodi's ergometer is preferable to the manometer for measuring the intrapleural pressure, since oscillations of the manometer would be of little amplitude. A case is reported in which a selective pneumothorax was induced at the site of an apical lesion. X-ray after four insufflations of increasing amounts, and with increasing pressures, showed that collapse was limited to the diseased area. Seven months later, pleural effusion appeared, displacing the superior lobe. In a few months it occupied the upper two-thirds of the hemithorax, and then gradually disappeared. Attention is called to the fact that it was not pleural adhesions that prevented collapse of the inferior lobe, since roentgenograms showed free respiratory motion in this region throughout the period of collapse treatment. Why did the constant stimulation of intrapleural air and the later effusion not cause the parietal and visceral pleura of the inferior lobe to adhere?

And why was the pleural effusion limited to the upper part of the pleural cavity? In this case the effusion caused practically no symptoms but maintained the desired collapse. There is doubt, however, as to whether or not an effusion should be replaced by air in some cases.—*Pneumothorax électif direct. Pleurésie élective, J. Cornudella, Arch. Med. Chirurg. d. l'Appar. Resp., 1931, vi, 243.*—(*E. K.*)

Bilateral Artificial Pneumothorax.—Bilateral artificial pneumothorax, simultaneously induced, occupies a definite place in the field of collapse therapy, and in properly selected cases is followed by gratifying results. Pneumothorax may be instituted on both sides within a short interval (five to ten days), or it may be started at some later date following a well-established monolateral collapse. Reactivation of an old lesion or new involvement in the contralateral lung may indicate the need of a collapse of the contralateral lung. A simultaneous collapse gives the best results when the lesions are sharply delimited and well circumscribed; it is also indicated in cases with an early lesion or cavitation on one side and scattered infiltrations without marked perifocal inflammation on the other. This type of pneumothorax is contraindicated in the presence of extensive bronchopneumonic disease, grave toxaemia and cachexia, and widespread extrapulmonary tuberculosis. The strictest technique should be observed and an attempt made to obtain as selective a collapse as possible, so that the unaffected portions of the lungs may function. The ideal results are obtained with alternating insufflations, using 200 to 300 cc. of gas every five or six days. Anoxaemia, in prudently conducted cases, rarely occurs. Maintenance of an intrapleural hypotension is advised. Symptoms of asphyxia have been observed following the rupture of adhesions or cavities. Fluid is sometimes noted but with no greater frequency than in unilaterally compressed cases. In patients with a fluctuating mediastinum, a contralateral or simultaneous pneumothorax is sometimes of value in correcting any mediastinal or cardiac deformities so often encountered in monolateral pneumothorax.—*Sul pneumotorace bilaterale, A. Longo, Tubercolosi, December, 1931, xxiii, 425.*—(*U. E. Z.*)

Bilateral Artificial Pneumothorax.—Pneumothorax may be given either successively or simultaneously on both sides. In the selection of cases for bilateral treatment, great caution is necessary. The vital capacity should not be below 2,500 or 2,000 cc.; it should not drop below 800 to 900 cc. at any time during the treatment. The treatment should be started on the more affected side and the inflations must be small and should not be given on the same day on both sides. It is frequently observed that one side will show faster resorption of air than the other side. As far as complications are concerned, they are the same as in unilateral pneumothorax. Bilateral pneumothorax may be completed by intrapleural pneumolysis on the same indications as in unilateral treatment. It is recommended that reexpansion should not be allowed until the patient has been free of bacilli for at least one and a half years.—*Was ist vom bilateralen Pneumothorax zu halten? A. v. Frisch, Wien. klin. Wchnschr., April 8, 1932, xlv, 470.*—(*M. P.*)

Bilateral Artificial Pneumothorax.—Bilateral pneumothorax must be induced gradually by small and frequent refills and should not be carried beyond a vital capacity of 800 cc. The vital capacity should always be at 1500 cc. or above, before it is permissible to establish this procedure. The side of first collapse should be put down two or three months before pneumothorax is begun on the other side. Thirty-nine patients have been thus treated during the last ten years. Of these, 28 may be analyzed as follows: 4 per cent cured, 43 per cent improved, 25 per cent worse and 28 per cent dead. Such results are not very encouraging although the procedure should be tried whenever it is indicated.—*Über doppelseitigen künstlichen Pneumothorax, Harms and Grünewald, Deutsche med. Wchnschr., January 1, 1932, lviii, 4.*—(*H. S. W.*)

Complications of Artificial Pneumothorax.—The complications which arise during artificial pneumothorax treatment are summarized, with the exclusion of mediastinal shifting and pleural effusion, since these two complications will be discussed in a separate article. The most dangerous complication is air embolus. It occurs when air enters a vein of the thorax or a vein in a pleural adhesion. It may cause sudden death by failure of the right heart or by obstructing the coronary arteries or vital cerebral centres. On the other side small emboli in various regions may occur without serious or permanent damage. This complication can usually be avoided by ascertaining that the needle is really in the pleural cavity, as indicated by respiratory fluctuations definitely on the negative side. If fluctuations are around the zero point the needle is in the lung. It is further important to avoid traumatizing a larger blood-vessel. Therefore the use of a dull cannula is ad-

vised, particularly for the first inflation. A second complication is the extrapleural pneumothorax in which air collects between parietal pleura and the endothoracic fascia. This occurs when the parietal pleura is not pierced but is pushed away from the thoracic wall. The manometric readings in such cases are small and close to the zero point. Air inflated under these conditions may reach the posterior mediastinum and the retropharynx, producing characteristic embarrassment of deglutition. A third complication is emphysema in a thickened pleura. This is indicated by a sudden rise of the pressure after the introduction of small amounts of air. The pressure sinks rapidly again. This complication involves no danger to the patient. Another complication is mediastinal emphysema with its well-known dangers. It is produced by insufflating the interstitial tissue of the lung. Again a close observation of the manometric readings will prevent this occurrence. Subcutaneous emphysema is usually not perilous but frequently a very annoying complication. It may be produced by direct insufflation of air into the subcutaneous tissue as the needle is withdrawn from the pleural space, or in the presence of high positive pressure in the pleural space, sometimes following spontaneous pneumothorax, or by the rupture of a cavity through the pleura; or, in the presence of moderately positive pressures, violent cough may force the air through an injured parietal pleura. It is therefore important to prevent paroxysmal cough after inflation. Contralateral pneumothorax is an extremely rare occurrence and is explained by the introduction of air in the contralateral pleural space in the presence of a mediastinal hernia. Pneumoperitoneum has been observed in cases with high diaphragms in which the needle pierces apparently the costodiaphragmatic angle. The manometer shows negative respiratory fluctuations which, however, are paradoxical. Spontaneous pneumothorax on top of an artificial pneumothorax can not be prevented with certainty. Prophylactic measures are the avoidance of high positive pressures, especially in the presence of adhesions attached to a cavity-wall or in the presence of thin-walled subpleural cavities, and by the proper indication in cases of exudative lesions. Haemoptyses are always an indication of trauma to the lung tissue. They may occur on account of stasis in incomplete pneumothorax. Dyspnoea should always be considered as an alarming symptom: it may be caused by marked mediastinal shifting, by mediastinal emphysema, by circulatory insufficiency or by chronic pulmonary emphysema. The latter two conditions are therefore contra-indications against the induction of an artificial pneumothorax. Increase in temperature following inflation may be due to an increased absorption of toxic material. This can be avoided by slowly increasing the amount of collapse. Rise of temperature is observed if inflations are given during the menstrual period, or it may be caused by the formation of a pleural exudate, by focal reactions, or by extension of the tuberculous process.—*Welche Komplikationen treten im Verlaufe des künstlichen Pneumothorax auf und wie kann man sie vermeiden?, J. Sorgo, Wien. klin. Wchnschr., March 11, 1932, xlv, 340.*—(*M. P.*)

Adhesions in Artificial Pneumothorax.—Referring to Sergent, who said that each lobe is a small lung, the author points out that apical adhesions have to carry the weight of the entire lung, if the interlobar fissures are obliterated, and that they will be unduly stretched if too high pressures are applied. The level of the interlobar fissures, especially on the right side, is a site of predilection for adhesions because interlobar pleurisies have the tendency to involve the parietal and visceral pleurae. Such adhesions represent a serious complication of artificial pneumothorax if the mediastinum is movable and tends to bulge to the other side. A case is reported, in which an enlargement of an existing cavity and a herniation of the mediastinum to the other side was noticed. With the institution of bilateral pneumothorax the mediastinum returned to its normal position and the cavity diminished rapidly. The author assumes that the enlargement of the cavity was in reality a tear in the pulmonary parenchyma caused by an excessive stretching of the existing adhesions. Apical adhesions are negligible if each lobe is freely movable. Adhesions, inserting at the interlobar fissures, necessitate the discontinuation of the artificial pneumothorax if the mediastinum is not fixed, and either intrapleural pneumolysis or phrenicectomy should be considered in these cases.—*Le rôle des adhérences et de la mobilité du médiastin dans le traitement par le pneumothorax artificiel, F. deKovats, Rev. d. l. Tuberc., January, 1932, xiii, 30.*—(*K. F.*)

Pleural Effusion after Artificial Pneumothorax.—In a series of 68 cases of pulmonary tuberculosis in which the course of artificial-pneumothorax treatment had been concluded, it was found that 68 per cent developed fluid during the treatment. About 90 per cent of these fluids were recognized during the first year of treatment. The theory is presented that all pleural effusions compli-

cating artificial pneumothorax therapy are due to the breaking of adhesions, the rupture probably occurring at the site of a tubercle, consequently liberating tubercle bacilli into the pleural cavity. A large majority of these cases showed a marked improvement and a greater amount of collapse after the effusion occurred.—*Pleural Effusion in Artificial Pneumothorax Treatment, A. P. Ford, Tubercle, April, 1932, xiii, 292.*—(*M. E. P.*)

Free Intrapleural Bodies after Artificial Pneumothorax.—Since 1922 many reports have been made of the appearance of free intrapleural bodies after induction of artificial pneumothorax. They usually appear within an effusion and disappear spontaneously, before or with absorption of the fluid. Less often they appear after resorption of an effusion. One case is reported in which a free intrapleural mass appeared after thoracoscopy and severance of adhesions. They are well tolerated by the patient and discovery is accidental on roentgenological examination. In a few cases the patient has been able to feel the mass strike the thoracic wall, but no other symptoms have been noted. Roentgenograms reveal a shadow of varying density, size, and shape. It may be a pear-shaped, pediculated body that oscillates with motion of the thorax. The pedicle is apparently attached to the pleura in some cases. The body may have no pedicle but be suspended within the fluid, or lie immobile against the parietal pleura. One case is reported in which four of these masses appeared simultaneously. The composition of these intrapleural bodies and the cause of their formation are not known. Massive coagulation of liquid, intrapleural haemorrhage, cellular proliferation of the pleura, preëxisting masses of false membranes, and inflammatory products have been suggested as possible explanations. Since they disappear spontaneously, only accident will render possible their examination at autopsy. Further information must be sought by thoracoscopy, and by histochemical examination of any portions that can be procured during thoracoscopy.—*Corps libre intrapleural, P. Pruvost, F. Lepennetier and A. Meyer, Arch. Méd.-Chirurg. d. l'Appar. Resp., 1931, vi, 247.*—(*E. K.*)

Oleothorax.—In 46 cases olive oil, heated to body temperature with from 2 to 2.5 per cent gomenol, was used at first in small doses in order to test the sensitiveness of the pleura. It was found, however, that the degree of pleural reaction does not increase with the quantity of the injected oil or with the pressure, and greater doses were therefore applied. The injections were made in the middle axillary line with a 100-cc. syringe and a needle of from 0.7- to 1.0-mm. inner bore and without the aid of an oil manometer. The pressure in the air-pocket above the fluid-level was, however, controlled with a water manometer. With the exception of the last refill, which was done in a lateral recumbent position in order to replace the small remaining air-bubble by oil, injections were made while the patient was in a half-sitting position. The results varied with indications for oleothorax. For purposes of disinfection oleothorax yielded 50 per cent good, 10 per cent satisfactory, and 40 per cent unfavorable results. With "mechanical oleothorax," under which heading come "elective," "compression" and "prevention" oleothorax good results were obtained in 66 per cent. Oleothorax failed in 14 per cent, while satisfactory results are observed in 20 per cent. The following complications are mentioned: *1:* Pleural irritability, found in 22 patients (47 per cent), and characterized by fever, pains in the chest, nausea and headaches. In the absence of an effusion the pleura seemed to be more sensitive. *2:* Exudate-formation: In 6 cases the injection of oil was followed by the formation of a serofibrinous effusion which became purulent in three patients. *3:* Reactions to high pressures: dyspnoea, displacement of the mediastinum, pains in the chest radiating to the arm are listed as symptoms. *4:* Pleuropulmonary perforation, which occurred in 2 patients with ultimate recovery. *5:* Superficial infiltration of the skin, noticed in one case with the formation of a sinus. *6:* Scoliosis, with convexity toward the affected or toward the contralateral side, a late complication observed after six months of treatment or later. *7:* A marked ptosis of the diaphragm of the treated side. The results indicate that mechanical factors are more important than a disinfecting action of the oil. Oleothorax is the method of choice in the treatment of pleural effusion following artificial pneumothorax. It is less successful in the treatment of nontuberculous purulent effusions.—*Analyse des résultats obtenus dans 46 cas de tuberculose traités par l'oléothorax, L. Daniello and M. Alexandrov, Rev. d. l. Tuberc., December, 1931, xii, 1171.*—(*K. F.*)

Artificial Pneumothorax and Phrenicectomy.—Forty-three cases of pulmonary tuberculosis were treated with pneumothorax and phrenicectomy. Thirty of them had demonstrable pleural adhesions. Favorable results were obtained in 20 cases (47 per cent). All showed increase in weight, 6 became sputum-free and 14 experienced marked decrease in the volume of the sputum. Eight-

een cases became bacillus-negative. The combined treatment yielded an incidence of 47 per cent improvement, which corresponds to the incidence from pneumothorax alone. The combined treatment was satisfactory in general, although dyspnoea, vagal irritation and displacement of the mediastinum led to disagreeable symptoms in some cases. Phrenicectomy has not appeared to shorten the period of treatment. Phrenicectomy should be employed only when pneumothorax treatment is unsuccessful.—*Zur kombinierten Kollapstherapie (Phrenikusexairese und Pneumothorax) der Lungentuberkulose, W. Hebenstreit, Deutsche med. Wchnschr., August 28, 1931, lvii, 1489.*—(*H. S. W.*)

Phrenicectomy.—Paralysis of the diaphragm by phrenic evulsion lessens the length of the chest-cavity, thereby decreasing the expansion of the lung and, to a great extent, the downward displacement of the organ during inspiration. The results of the operation in 57 cases of pulmonary tuberculosis are analyzed. Benefit has accrued in both basal and apical lesions. The benefit is due to the absolute and permanent diminution in the strength and size of the affected lung. The lower zone on the side of the evulsion shows the largest amount of collapse and the upper zone on that side a smaller degree of it. On the collateral side there is some compensatory expansion. The analysis indicates that evulsion benefits all types of cases, including both basal and apical ones, but the benefit is greater and the results good in a larger percentage of basal lesions. If the whole lung is affected, the benefit seems to be quite as marked as when the base alone is affected. Of 3 bilateral phrenic-evulsion cases, one was slightly benefited and two remained unchanged. These were advanced bilateral fibrocaseous lesions with a very poor prognosis under ordinary conditions.—*The Rationale of the Treatment of Pulmonary Tuberculosis by Phrenic Exairesis, M. K. Pai and K. V. Rao, Tubercle, April, 1932, xiii, 295.*—(*M. E. P.*)

Phrenicectomy.—A sufficient number of cases of phrenic exairesis have been reported to warrant the statement that this operation has earned for itself a definite place in phthisiotherapy. The indications for its use are found largely in unilateral cases, in patients who do not respond well after several months of usual bed-rest treatment, or who have persistent open cavities with positive sputum, or constant cough and expectoration as prominent symptoms. It is further indicated as a safeguard for those who cannot or will not receive proper treatment after leaving the sanatorium; also in the great majority of cases in which pneumothorax has been tried without success, as well as an adjunct for many pneumothorax cases; also either preceding or following thoracoplasty, to insure a more perfect collapse. The operative dangers and complications are so rare that they may be absolutely disregarded. The results seem to show that distinct benefits are derived in more than 50 per cent of the cases in which it is tried.—*Phrenic Exairesis in the Treatment of Pulmonary Tuberculosis, F. B. Trudeau, J. Am. M. Ass., January 23, 1932, xcviii, 309.*—(*G. L. L.*)

Technique of Apicolysis.—The detailed technique for apicolysis, with resection of segments of the upper two ribs, is given. Paravertebral incision permits the resection of parts of the third and fourth ribs also, if the localization of cavities necessitates a more extensive procedure. The resection of the first rib is technically the most difficult on account of the neighborhood of the brachial plexus and subclavian vessels.—*A propos de la technique de l'apicolyse, R. Proust, Rev. d. l. Tuberc., January, 1932, xiii, 65.*—(*K. F.*)

Apicolysis without Tamponage.—Apicolysis, without pressure by implanted tissue flaps or plastic material, is advocated and the rationale of this operation is discussed. The results of extrapleural pneumolysis, with the introduction of wax are not satisfactory, and statistics published by French observers, as for instance, Gaffaerts and de Winter or Sebrechts, show a high immediate mortality, with good results obtained in from 52 to 56 per cent. Apicolysis combined with phrenicectomy has been practised by Jacovici, Lauwers, Loeschcke, and Rost, who all used a supraclavicular incision. The authors claim that the main factor in the obliteration of apical cavities is a separation of the adherent pleura from the bony framework of the chest, which will allow cicatricial retraction of the cavity-walls. The dangers of extrapleural pneumolysis with the introduction of a plastic mass, with or without rib-resection, are mentioned. Perforation into a cavity is the most serious immediate danger of the operation. More remote disadvantages are migration of the filling material toward the base, and displacement of the cavity, obstruction of the draining bronchus by excessive pressure, pressure on the right auricle in right-sided cases, the formation of a serosanguineous exudate, and immediate or late infection. The authors refrain, for these reasons, from the introduction of a filling material, and prefer a simple apicolysis with rib-resection, using a paraverte-

bral incision, a technique which is similar to that devised by Mallet-Guy and Desjacques.—*L'apicolyse sans plombage, R. Proust, A. Maurer and J. Rolland, Rev. d. l. Tuberc., January, 1932, xiii, 56.*—(*K. F.*)

Pleural Dome in Apical Collapse Therapy.—Renewed attention is given to surgical treatment of pulmonary tuberculosis, especially for apical lesions. Thoracoplasty and apicolysis are here considered. Knowledge of the anatomy of the region of the pleural apex is essential in order to comprehend the value of these procedures and the indications for each. Since Zuckerkandl and Sebileau, the pleural apex has been known to be suspended, fixed, to the base of the neck. Sebileau described this suspensory apparatus as consisting of the transversopleural and costopleural ligaments, and the vertebropleural fascia. Each of these he credited with insertions into the pleura at the apex. Further investigations were made, giving special attention to the vascular aponeurotic system. These aponeurotic laminae are supported and guided by the vascular trunks and their branches. The bronchiocephalic arterial trunk, the left common carotid, and left subclavian ascend in the same fibrocellular lamina, directly previsceral in the median region where it is reinforced by the fascia of the sternocostothyroidian muscle. At the base of the neck it expands along the branches of the carotid and subclavian trunks. The vertebral artery carries it and fixes it to the transverse processes of the sixth and seventh cervical vertebrae, forming the sagittal vertebropleural fascia. Next, the cervicointercostal trunk draws it back to the neck of the first rib, guided by the superior intercostal branch which passes into the internal costopleural ligament. The supraretropleural fossa is formed by this sudden deviation. The thyrobicervicoscapular trunk draws the aponeurosis backward, reinforced by the transversopleural ligament. This lamella, following the thyroidian above and the scapular and cervical branches below, seems to enclose the anterior scalenus muscle. The lamella of the internal mammary artery is continuous with the endothoracic fascia at the point where the anterior intercostal branches are given off, forming the costopleurodiaphragmatic ligament of Le Dentu and Lannelogue. It is seen that a continuous fibrous dome is formed by the extension of the endothoracic fascia up to where it is supported by the division of the subclavian. From this dome emanate the suspensory ligaments which follow blood-vessels. Attention is called to the fact that the anterior scalenus inserts not only on the first rib but usually on this fibrous dome also, sometimes extending as far behind as the subclavian which then seems to pass through the muscle. The venous aponeurotic system consists chiefly of the jugulovertebral system which follows the vertebropleural ligament, and of the more superficial transverse cervical aponeurosis carried by the external jugular. Thus it is found that the suspensory ligaments are all reinforcements of the same fibrovascular sheet, guided and supported by blood-vessels, not inserting in the pleura but continuing into the endothoracic fascia. The pleural apex can be completely separated from the fibrous dome without encountering connecting tissues. Apical collapse is not obtained by mere destruction of the ligaments, but complete liberation of the subclavian and its branches from their fibrous walls would be necessary. In thoracoplasty resection of the first rib is now generally conceded necessary. With simple resection of the anterior and posterior segments of the superior ribs, transverse compression of the pleural apex incident to diminution of the transverse thoracic diameter, along with the resistance maintained by the subclavian, opposes complete collapse. The apex is not obliterated but merely depressed. Apicolysis, separation of the pleural apex from the fibrous lining of the thorax, is easy anatomically. Surgically, difficulties encountered consist in finding the plane of cleavage, not deviating from this plane after it is found, and getting a complete separation. Resection to a certain extent of the second rib saves time and facilitates complete separation of the pleura. On the cadaver, the gloved finger is used to separate the anterior then the lateral sides. Next the hand is put back inside to separate the apex, from without inside, guiding it by the point of division of the subclavian. This technique has perhaps value only in the dissecting-room. On the living, rough dissection with a tampon is suggested, with the use of compresses soaked in cooled serum for oozing. For the solution of the surgical problem, due to thinness and friability of the pleura, one is referred to L. Bérard. Methods for maintaining apicolysis now being studied include filling the apical space with fat, muscle, fragments of cartilage or with paraffin. Surgical or physiological (with alcohol) destruction of the phrenic nerve would be of help by immobilization of the corresponding hemidiaphragm. Further investigation is required to determine indications for surgical therapy, and methods of technique.—*La suspension du dôme pleural et son rôle dans les résultats de la collapsothérapie apicale, P. Truffert, Arch. Médico-Chirurg. d. l'Appar. Resp., 1931, vi, 199.*—(*E. K.*)

Chronic Uveitis.—While it is easy to diagnose typical progressive caseating lesions

in the eye, a number of other chronic eye diseases whose tuberculous aetiology has long been suspected, present great difficulties for an aetiological diagnosis. It is pointed out that the diagnosis of miliary tubercles in the choroid is frequently not made because there are no clinical signs of a generalized miliary tuberculosis. But it is well known that miliary tubercles may occur in various organs without a generalized spread and that they may heal. The tuberculous inflammation of the iris appears clinically just the same as inflammations of other aetiology. But even in the absence of tubercles, tuberculosis may be the cause. The histological examination which is usually possible only in late stages does not reveal any specific tuberculous tissue, and tubercle bacilli are usually not present. The absence of typical tuberculous tissue does not permit one to exclude tuberculosis. An additional reason for assuming a nontuberculous aetiology in such cases is the fact that most of these patients do not show clinically demonstrable tuberculosis elsewhere in the body. Other aetiological agents such as rheumatism, gonorrhea, syphilis and other infectious lesions may contribute to the disease. During the last 10 years this problem has been studied methodically in close correlation with other clinicians. It was found that with more careful examination, including chest X-rays, the number of patients who had no sign of pulmonary tuberculosis decreased very markedly. In the majority of these patients it was possible to establish the clinical picture of *pleurite à répétition* or the presence of slight apical lesions. Most of the patients react to tuberculin. On subcutaneous injections focal reactions were frequently observed and produced not infrequently a marked improvement. In the treatment with tuberculin it is important to avoid marked focal reactions, and the treatment should therefore be given under careful ophthalmological control. The results of tuberculin treatment are so convincing that one may hardly doubt the aetiological significance of tuberculosis. On this basis a majority of iritis and uveitis may be classed as tuberculous. The same is true of the so called idiopathic iridocyclitis in old women. In a number of patients with tuberculous iritis or uveitis, tubercle bacilli were demonstrated in the blood, using Loewenstein's cultural method.—*Zur Frage der tuberkulösen Aetiologie der chronischen Uveitis und anderer entzündlicher Erkrankungen des Auges, J. Meller, Wien. klin. Wchnschr., January 8, 1932, xlv, 33.*—(*M. P.*)

Allergic Asthma from Ursol.—Contact with ursol will produce true allergic manifestations in specifically hypersensitive individuals, but will be without effect in nonsensitive persons. A case report is given of a woman, who, on handling hides dyed with ursol, developed classical attacks of bronchial asthma, but remained free of asthma when not in contact with skins so dyed. Intracutaneous tests made with dilute solutions of the dye gave strongly positive reactions in this patient, but negative reactions in normal controls. Similarly the patient reacted with bronchial asthma to an ursol inhalation test, whereas an asthmatic patient sensitive to climatic changes failed to manifest symptoms.—*Zur Frage der allergischen Natur des Ursolasthmas, G. Straube, München. med. Wchnschr., May 6, 1932, lxxix, 745.*—(*V. T.*)

Seasonal Influence on Asthma and Colds.—In Leiden, Holland, between August 8 and 10, and again about August 20, 1930, patients with asthma underwent an acute exacerbation of their symptoms. Coincidentally an approximate 11 per cent of normal individuals either caught colds or developed bronchitis. Asthmatic patients sleeping in allergen-free rooms did not manifest flares at these times. In 1931 similar studies showed two asthmatic periods. The first corresponded to that of the preceding year, August 8 to 10, when again not only asthmatic patients developed exacerbations, but also normal nonasthmatic individuals came down with colds and bronchitis. This period, as in the year previously, was without effect on patients sleeping in allergen-free rooms. The second period began in the middle of September and was preceded by an epidemic of an highly infectious upper-respiratory infection. During this interval exacerbations of the asthmatic state occurred, not only in patients living outside the clinic, but also in those residing in allergen-free rooms, although in this latter instance to a far lesser degree.—*Asthma, Bronchitis, und Schnupfen in Zusammenhang mit der Jahreszeit, W. S. v. Leeuwen and C. de L. v. Wijngaarden, München. med. Wchnschr., April 8, 1932, lxxix, 583.*—(*V. T.*)

Vincent's Infection of Pleura.—A case of fusospirochetal infection of the mouth, vagina and pleura without an obvious basic pathological condition of the lungs is reported. At the first tapping of the chest 600 cc. of putrid, thick, greenish-yellow liquid was removed, which grossly resembled pus due to colon bacilli. Vaginal examination at this time revealed a thick, foul purulent discharge with no specific cervical lesions, although examination was unsatisfactory. Vincent's spirilla and fusiform bacilli were reported present in the smears of the pleural fluid, vaginal secretion, throat and gingiva. A dark-field study of the vaginal discharge

and pleural fluid revealed many motile spirilla. Two days later the ninth rib posteriorly was resected and two large pus-pockets were drained. The patient was discharged two months later in fairly good condition. The thoracotomy wound had entirely healed and the physical signs were those of thickened pleura over the left lower hemithorax, chiefly posteriorly. The rarity of fusospirochetal pleural infection is matched by that of vaginal infection. The mode of entry in fusospirochetal pulmonary infection has been the subject of considerable investigation, chiefly as regards abscess. The frequent occurrence of the organisms in the mouths of supposedly normal people and in pyorrhoea alveolaris has led the majority of observers to consider the respiratory passages as the portal of entrance. The authors have failed to find a record of any case of pleuritic involvement without underlying pulmonary lesion. In this case observations made after the injection of iodized oil suggest a bronchiectasis, although the evidence is not conclusive.—*Fusospirochetal (Vincent's) Infection of Pleura and Vagina, H. D. Jump and S. J. Sperling, J. Am. M. Ass., January 16, 1932, xcviii, 219.*—(*G. L. L.*)

Intrapleural Pressure in Spontaneous Pneumothorax.—The relation between intrapleural pressure and the signs and symptoms of spontaneous pneumothorax was studied in a series of cases. In cases with asphyxia, due to high intrapleural pressure, relief is rarely obtained by withdrawal of air. The condition of the other lung, acute cardiac insufficiency, and pleural shock cause the more alarming symptoms, while the high pressure *per se* has a minimal effect. Many theories have been advanced to explain the amphoric soufflé and metallic ringing heard in spontaneous pneumothorax, but none are universally applicable. These amphorometallic sounds are found in the open, closed, and valvular types of spontaneous pneumothorax, with and without effusion, but are very rarely found in artificial pneumothorax. They are usually heard only after positive pressure has been attained. As the pressure is increased, a point is reached at which the amphorometallic qualities are most clear, but with further increase of pressure they become muffled and finally disappear. The height of pressure at which these tones are most distinct varies in different cases. Rarely, they are heard at a negative pressure and disappear when positive pressure is reached. Any noise that resounds within the thoracic cavity in the presence of increased pressure, may acquire an amphorometallic quality. In one instance the cardiac sounds were heard as a metallic ringing that increased and decreased in intensity in a manner parallel with that of the other amphorometallic sounds. Transformation of bubbling râles into metallic ringing has been observed as the intrapleural pressure was increased, and this is thought to be the logical explanation in all cases for this ringing. In a series of cases of primary serofibrinous pleurisy, auscultation elicited no sounds, although air was introduced and fluid withdrawn, so that the intrapleural pressure was varied from negative to highly positive. Fibrinous deposits on the pleural walls possibly prevented reflection of sound-waves that would have been reflected from the smooth surfaces of a normal pleura. Or, the pulmonary lesions were perhaps too small to cause adventitious sounds. The only explanation that has been suggested for the silence of artificial pneumothorax is that a pleuropulmonary fistula is essential for the production of the amphorometallic sounds. But these sounds have been observed in the closed type of spontaneous pneumothorax. The intrapleural pressure of an open pneumothorax oscillates only slightly above and below zero. In all other types of pneumothorax, including those with and without effusion, the intrapleural pressure varies as the patient assumes different positions. It is greatest when the patient lies on the affected side, decreases when he lies on his back, is still less when he sits upright, and least when he lies on the unaffected side. Therefore, any records of a pneumothorax should indicate the position of the patient when the pressure is noted.—*La pression intrapleurale dans le pneumothorax spontané, N. Stoichitza and G. Dinischiouto, Arch. Méd.-Chirurg. d. l'Appar. Resp., 1931, vi, 317.*—(*E. K.*)

Determination of Volume of Pneumothorax.—A method is described which makes it possible to determine the exact volume of a pneumothorax cavity by the introduction of a known amount of carbon dioxide and by the analysis of the resulting mixture.—*Die Volumenmessung des Pneumothorax, P. Martini and A. Heymer, Klin. Wchnschr., April 9, 1932, xi, 631.*—(*M. P.*)

Spontaneous Pneumothorax Simulating Perforated Gastric Ulcer.—An instance, in which spontaneous pneumothorax was diagnosed as perforated gastric ulcer, led to a laparotomy. The affection manifested itself by severe pain in the gastric region and in that of the left shoulder, nausea and shock. Its true nature was recognized the next day. The patient proceeded to an uneventful recovery. Five weeks after its occurrence the pneumothorax had completely disappeared.

No signs of pulmonary tuberculosis were detectable. The rupture in the pleura probably took place in an emphysematous bleb.—*Spontanpneumothorax unter dem Bilde des perforierten Ulcus ventriculi, M. Siebner, Deutsche med. Wchnschr., February 12, 1932, lviii, 252.*—(*H. S. W.*)

Pulmonary Fibrosis with Bilateral Spontaneous Pneumothorax.—A man of twenty-five years enlisted in the army in March, 1925, and for a short time worked in an open stone-quarry. In May, 1925, he developed an ulcerative colitis. Soon after this he suffered pain in the chest, with productive cough and dyspnoea. He had fever up to 102°, chills, night-sweats, loss of weight, and pain in the lower abdomen. He developed pruritic, shallow, indolent ulcers on his skin. X-ray of the chest showed a fine mottling, symmetrically distributed in both lungs from the first to fifth ribs. After fourteen months he was discharged from the hospital improved. He reëntered in November, 1930, complaining of pain in the chest and diarrhoea. X-ray of the chest showed a very heavy, bilateral, interstitial fibrosis. Several times from January to April, 1931, the patient developed spontaneous pneumothoraces, some of which were bilateral. All laboratory studies were negative for tubercle bacilli. The patient was discharged in September, 1931, unimproved. This was thought to be a case of mycotic disease despite the repeated negative laboratory findings. Comments on the aetiology shall be welcomed.—*A Case of Pulmonary Fibrosis of Obscure Etiology, with Bilateral Spontaneous Pneumothorax, A. Bowen, Radiology, January, 1932, xviii, 121.*—(*T. O. R.*)

Bilateral Traumatic Pneumothorax.—A white boy of thirteen years was struck in the back by a hay-fork. Bilateral pneumothorax resulted. Twice within twenty-four hours air was aspirated from the more extensively involved side by reversing the bottles on the pneumothorax box. One month after admission X-ray examination showed complete reëxpansion of the lung.—*Bilateral Traumatic Pneumothorax, with Recovery, L. R. Lingeman and W. Fenstermacher, Radiology, September, 1931, xvii, 577.*—(*T. O. R.*)

Empyema.—The treatment of empyema differs radically, depending upon its differentiation by smear and culture into a pyogenic or tuberculous origin. The mortality rate and the incidence of chronicity in acute empyema depend not only on treatment but also on the type and virulence of infection, on the pathological anatomy, age and general condition of the patient, and on the nature and gravity of the primary infection, of which it is almost always a complication. Comparative statistics of results of different methods of treatment that do not take these variable factors into account are inconclusive and misleading. The fundamental principle of treatment is drainage, instituted early, by a method that will not embarrass respiration and circulation, and maintained until the cavity is obliterated, plus general supportive measures. In the early stages of an acute empyema, before the lung has become adherent or the mediastinum has stiffened, the two pleural cavities function as one. Open drainage then lowers the respiratory function of the other lung. If the vital respiratory capacity is reduced by a coincident pneumonia and toxaemia or other cause, or if the patient is an infant who normally has a low vital capacity, such open drainage always adds to the respiratory load, often to a degree beyond the patient's compensatory reserve. Closed drainage not only does not interfere with respiratory capacity but improves it. It is therefore the method of choice in all early, acute cases, in severely ill patients and in infants. Irrigation with antiseptic solutions makes possible the removal of all the pus without changing the intrathoracic pressure relationships and it is bactericidal. Ordinary rib resection and pus drainage is the alternative method, after the lung has become fixed by adhesions, and is the method of choice in cases with large bronchial fistulas. Closed drainage and irrigation with surgical solution of chlorinated soda in chronic cases usually reduces the size of the cavity to a marked degree, improves the patient's condition and prepares the field for operation. Residual empyema cavities may be obliterated by plastic operations varying according to their size, shape and position. Cavities involving the whole pleural cavity can be obliterated with minimal operative risk by a graded posterior and later extrapleural thoracoplasty, followed by the removal of the thickened pleura over the residual cavity. Drainage is contraindicated in sterile tuberculous empyema. If without clinical evidence of associated pulmonary tuberculosis on the same side, air is substituted for the pus, and an attempt is made to bring about reëxpansion of the lung. If there is associated active pulmonary tuberculosis, pneumothorax is continued, and, if pus continues to form, a plastic obliteration of the cavity is brought about, as for the non-tuberculous type. Undrained tuberculous empyema with a mild grade of pyogenic infection may be treated as though sterile tuberculosis. If there is a draining sinus, or if the pyogenic infection is virulent, treatment at

first is by the closed method for the pyogenic infection followed by a complete thoracoplastic collapse and excision of parietal pleura over the residual cavity.—*The Treatment of Empyema, C. A. Hedblom, J. Am. M. Ass., December 26, 1931, xcvii, 1943.*—(*G. L. L.*)

Empyema and Fistula in Bronchiectasis.—Costal resection was performed for drainage of an empyema which was secondary to a then unrecognized bronchiectasis. The symptoms returned two years later, and, roentgenologically, a triangular opacity, extending from the hilum into the base of the lung, led to a diagnosis of mediastinal pleurisy. A second costal resection was performed but no pus was found. A blood culture showed typhoid bacilli; this infection, independent of the pulmonary condition, was responsible for the symptoms then present. A fistula resulted from the second operation. By means of a sound and lipiodol introduced into the tract from without, the fistula was found to communicate with the bronchi. Roentgenological examination after intratracheal injection of lipiodol verified this fact and revealed an advanced bronchiectasis. Treatment of the fistula consisted of injections of lipiodol and maintenance of patency, in order to ensure drainage of the bronchi. Attention is called to the following facts: Bronchiectasis may exist unrecognized until an advanced stage is reached. Foetid breath, long considered one of the cardinal pathognomonic signs, does not appear until late, when large sacs allow stagnation of pus. Roentgenological examination after intratracheal introduction of lipiodol permits early diagnosis. As a complication of bronchiectasis, empyema was formerly considered a mere possibility, and due to rupture of a bronchus. Recently it has been found to be a rather frequent complication, due to extension of infection along the bronchi to the tracheal bifurcation, and thence to the pleura. In bronchiectasis the roentgenogram may show a triangular shadow resembling that of mediastinal pleurisy.—*Fistule pariétale consécutive à un empyème symptomatique de bronchiectasies, E. Sergent, Kourilsky and Poumeau-Delille, Arch. Méd.-Chirurg. d'l'Appar. Resp., 1931, vi, 255.*—(*E. K.*)

Phrenicectomy in Bronchiectasis.—Phrenicectomy produces only a relaxing and not a compressing effect on the lung. Since bronchiectases are usually hard-walled dilatations of the bronchi, the action of a paralyzed diaphragm has but little therapeutic effect. But strictly basal and recent bronchiectases may be well influenced by the procedure. Since phrenicectomy, however, does produce occasionally some amount of symptomatic relief, it is wise to give this method a chance before more radical surgical methods are tried.—*Ist die Phrenikotomie bei nicht tuberkulösen Bronchiektasien angezeigt?, W. Denk, Wien. Klin. Wchnschr., June 10, 1932, xlv, 755.*—(*M. P.*)

Bronchial Stenosis.—A man of fifty-two years developed dyspnoea, thoracic pain, cough, expectoration and blood-streaked sputum. X-ray and bronchoscopic examination revealed a tumor, the size of a plum, in the left main bronchus which had produced a partial obliteration of the lumen.—*Verkannte Bronchostenose, W. Landau, Deutsche med. Wchnschr., November 20, 1931, lvii, 1977.*—(*H. S. W.*)

Foreign Body in Bronchus.—A woman of 35 years had an unproductive, paroxysmal cough for two years. Roentgenoscopic examination revealed an open safety-pin, which was assumed to be in the clothing. Nine years later the patient became pregnant and was delivered of a normal child. At this time she developed pneumonia and was very ill. Roentgenographic examination soon after this demonstrated an open safety-pin in the left main bronchus and the patient was referred for treatment. She was bronchoscoped but the pin was not seen. Further X-ray studies revealed it in the depths of the lower lobe of the left lung. Bronchoscopic examination was made under roentgenoscopic guidance. The pin could be grasped, but it was not sufficiently free to bring to the end of the bronchoscope. After the intravenous injection of sodium-ethyl-barbiturate, the patient was bronchoscoped and, under roentgenoscopic guidance, traction was applied. The pin broke at the spring. Both halves were easily removed. The patient was discharged in excellent condition.—*An Open Safety Pin in the Bronchus; Removal under Roentgenoscopic Guidance, P. P. Vinson and J. D. Camp, Radiology, December, 1931, xvii, 1302.*—(*T. O. R.*)

Observations on Bronchi in Acute Upper-Respiratory Infections.—Since 1924 about 50 cases have been observed in which the mucosa of an exposed bronchus (as seen through a bronchial fistula) showed catarrhal reaction after infection in the upper respiratory tract. There is an interval of about 24 hours between the onset of the upper and that of the lower respiratory-tract infection. When the acute infection in the nasal sinuses subsides, the local reaction in the bronchus does also. Bacteriological examination almost always reveals the same organism in the bronchus and in the nasal-sinus region. In many cases the prevailing

organism has been a streptococcus.—*Observations on the Reaction of Bronchial Fistulae to Acute Infections of the Upper Respiratory Tract, E. A. Graham, Amer. J. Surg., October, 1931, xiv, 382.*—(*J. P. B.*)

Acute Pulmonary Oedema.—*Case Report*: A colored man, aged 36, admitted to the Georgetown University Hospital, complained of extreme dyspnoea and expectoration of large amounts of frothy sputum. On admission, the lungs showed evidence of being filled with fluid. There was marked enlargement of the heart, and a diastolic murmur was heard in the second interspace on the left. Roentgenological examination showed a marked and diffuse enlargement of the heart, particularly in the region of the left ventricle, and definite dilatation of the aorta. Radiating out from the hilum on either side were areas of increased density, reaching in places almost to the periphery, but most marked at the lung roots. In places there was a tendency toward coalescence. Three days after admission roentgenological examination showed the lungs to be entirely clear, with no evidence of any of the shadows previously seen. This case is of interest for two reasons: first, roentgenological records of pulmonary oedema, during and following the attack are extremely rare; and second, these studies give a different concept of the pathology of acute pulmonary oedema. Apparently, certain groups of alveoli become filled with fluid as indicated by the splotchy appearance on the film. The remaining alveoli, particularly those situated at the periphery, are air-containing.—*Acute Pulmonary Edema, F. O. Coe and L. S. Otell, Am. J. Roentgenol. & Rad. Ther., January, 1932, xxvii, 101.*—(*W. I. W.*)

Lung Abscess.—The invasion and propagation of pyogenic microörganisms is the one aetiological factor common to all abscesses. The first roentgenographical evidence of an abscess, which is the result of aspiration, infection and blockage of secretion, is an area of increased density in the region of the obstructed bronchus. Subsequent studies may show extension of the area of increased density until an entire lobe or more becomes involved. Later, cavities may appear in which a fluid-level is discernible. The speed at which this extension takes place depends upon the virulence of the infecting microorganism and upon the interference of endobronchial drainage. Not all cavities excavate or show a fluid level. The location of the abscess may be demonstrated by stereoscopic roentgenograms and by bronchoscopy. Fluoroscopic studies frequently show that areas of lung markings may be brought out more satisfactorily at certain angles. This knowledge results in the more valuable X-ray plates. A pulmonary abscess in the acute stage may simulate lobar pneumonia. However, the consolidation in lobar pneumonia usually develops more rapidly, and a second plate taken at the end of twenty-four or forty-eight hours should serve to differentiate the lesion. Massive atelectasis has characteristic physical findings by which it may be diagnosed. In localized atelectasis, roentgenological and fluoroscopic studies should make the differentiation from abscess. An empyema, located adjacent to the mediastinum, results in a displacement of the mediastinal contents. An intralobar empyema may be demonstrated by fluoroscopic studies. Demonstration of tubercle bacilli in the sputum differentiates tuberculosis from abscess. An abscess may develop in a carcinoma of the lung which has become secondarily infected. If studies have been made previous to the appearance of the abscess, a comparison of the findings may make the diagnosis much easier. Bronchiectasis may be differentiated by X-ray studies and by the use of lipiodol. X-ray demonstrates a foreign-body, especially those of metallic nature, which may result in secondary lung abscess. Roentgen evidence is an important check on the efficacy of the treatment instituted. The important principle to observe in treatment is that the drainage be efficient, or open operation may be considered. Nineteen cases are outlined.—*Lung Abscess, W. A. Hudson, Radiology, January, 1932, xviii, 1.*—(*T. O. R.*)

Micrococcus Melitensis Lung Abscess.—A case is reported in which the blood showed positive agglutination for micrococcus melitensis one year after the appearance of a persistent pulmonary abscess. Drainage of the abscess had previously resulted in a fall of temperature, but at this time fever was continuous, causing Malta fever to be suspected. Pus from the abscess at no time showed any growth on cultures (gelatine and bouillon were used) at the end of 48 hours, and stained smears showed only intracellular gram-negative micrococci. It was concluded that the micrococcus melitensis septicaemia antedated and caused the pulmonary abscess.—*Abcès pulmonaire au cours d'une fièvre de Malté. Abcès mélitococcique? F. Delmas and G. Duhamel, Arch. Méd.-Chirurg. d. l'Appar. Resp., 1931, vi, 224.*—(*E. K.*).

Treatment of Lung Abscess.—Conservative treatment of pulmonary abscess yielded satisfactory results in four instances. Neosalvarsan and trypaflavine were of most

use among the drugs employed. Postural drainage helped. Pneumothorax is contraindicated. Neither bronchoscopic examination nor surgical procedure was tried on these four patients.—*Zur Behandlung der Lungenabszesse, F. Nagel, Deutsche med. Wchnschr., October 30, 1931, lvii, 1850.*—(*H. S. W.*)

Mediastinal Ephysema.—This not unusual complication following chest-wounds, especially those made by projectiles or crushing force, has been found also in the course of pertussis and bronchopneumonia in infants. It usually starts some hours or a day following a chest-wound, initiated by an attack of coughing or an attempt to sit up in bed. Marked dyspnoea with cyanosis appears immediately, with increasing embarrassment of cardiac function. Former treatises give as pathognomonic signs the appearance of a tumefaction with palpable crepitation at the level of the suprasternal fossa. But these are found late, only after the cervicothoracic aponeurosis has given way. Perceptible before these is a rigidity, or deep elastic pad, in the suprasternal or supraclavicular regions. Phrenic pain is an earlier highly significant sign. X-ray shows the lungs compressed toward the lateral thoracic walls. The mediastinal clearness is exaggerated, especially at the base and apex. The intercostal spaces may be enlarged. X-ray is of especial benefit in determining the presence of mediastinal emphysema in cases presenting a clinical picture of traumatic pneumothorax, without signs of infiltration of air in the neck. Marked cervical emphysema may follow laryngeal wounds, or arise from a neighboring subcutaneous infiltration of air. From experimental insufflation of the mediastinum, from autopsies and from clinical observation the conclusion is drawn that mediastinal emphysema cannot arise from a generalized subcutaneous emphysema. The cervical aponeurosis acts as a valve, permitting passage of air in one direction only. Treatment consists in drainage of the mediastinum immediately after diagnosis. Many methods have been proposed but all give insufficient drainage except one devised by the author. This has been used in four cases successfully. Experiments established the fact that the exit of infiltrated air in the mediastinum is along the entire superior orifice of the thorax, corresponding to the manubrium sterni anteriorly, the first dorsal vertebra posteriorly, and to the pleural apices laterally. This whole area must be drained. With local anaesthesia, or without it in case of emergency, and with the patient in a half-seated posture to lessen dyspnoea, a transverse incision of 6 or 7 cm. is made, with a slight concavity upward, half a finger's breadth above the manubrium, through the skin and two layers of fascia. The anterior edge of the sternomastoid muscle is sectioned, and the suprahyoid muscles separated with a grooved probe, revealing the pretracheal cellular tissue. Finger and probe are guided around the trachea back to the spine, then penetrated through the sagittal wall on either side, opening the retrovisceral space. Now all the fascial sheaths are open. To facilitate drainage the finger is wound around the superior border of the manubrium and the left brachiocephalic vein, then down to lacerate the fibrous vertebropericardial ligaments. A short large drain is placed in the wound. The mediastinal air fuses out freely, signs and symptoms disappear rapidly. Since, untreated, acute mediastinal emphysema is always fatal, this procedure should be instituted in all cases immediately after diagnosis.—*L'emphysème mediastinal aigu, J. Gatellier, Arch. Méd.-Chirurg. d. l'Appar. Resp., 1931, vi, 210.*—(*E. K.*)

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